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REPORT ON THE STATUS OF PROPRIETARY SCHOOLS IN ORTHODONTICS AND OF THE RECOGNITION OF SPECIALISTS IN DENTISTRY IN THE STATE OF NEW YORK

LEUMAN M. WAUGH, D.D.S., NEW YORK, N. Y.

CONSIDERABLE discussion has taken place before this Society in recent years relating to Orthodontic education and the status of the orthodontic specialist. A résumé of what has been accomplished, it was felt by your officers, would be of interest to all the members and of special significance to those practicing in the State of New York. This Society, perhaps quite wisely, has never had a committee to deal specifically with this problem. It has been content to entrust it to the attention of a few members who were especially interested. Some of these have been appointed by dental societies to several committees on dental specialties.

The first such committee was recommended by Dr. D. Austin Sniffen in his address as president of the Dental Society of the State of New York in 1938. As a result a Committee on the Dental Specialties was appointed by his successor, Dr. Russell W. Tench. It consisted of twenty-one members as follows:

Dr. D. Austin Sniffen, Chairman

Periodontics	Dr. John Oppie McCall, New York Dr. Harold J. Leonard, New York Dr. William B. Dunning, New York Dr. Sidney Sorrin, New York Dr. Charles A. Wilkie, Brooklyn
Prosthetics	Dr. Merrill G. Swenson, New York Dr. William H. Crawford, New York Dr. Charles M. McNeely, Brooklyn Dr. Clyde H. Schuyler, New York Dr. Russell W. Tench, New York

Professor of Dentistry and Director of Orthodontics, Columbia University.

Presented before the New York Society of Orthodontists at its Fall Meeting, Nov. 11, 1941, New York, N. Y.

Oral Surgery	Dr. Leo Winter, New York Dr. Henry Sage Dunning, New York Dr. A. C. Hitzelberger, Utica Dr. Harold S. Vaughan, New York Dr. Arthur H. Merritt, New York
Orthodontics	Dr. Clifford Glaser, Buffalo—University of Buffalo Dr. Samuel Hemly, New York—New York University Dr. Leonard Kohn, New York—Second District Dr. Franklin A. Squires—White Plains, Ninth District Dr. Leuman M. Waugh—Columbia University Subchairman

A number of meetings were held, two of which were by invitation with the State Board of Dental Examiners. The following expresses briefly the consensus of opinion which prevailed in this Committee.

a. The prosthodontists and the periodontists felt that exclusive specialization in these branches was undesirable because better service could be rendered by combining them with some general service; and because of lack of public appreciation and support.

b. The oral surgeons felt that exclusive specialization was not feasible except in very large centers, which are few in number.

c. Practically all were in general agreement that orthodontics is the most clearly defined and separate specialty of dentistry. Therefore, that best service can be rendered by the limiting of practice to this specialty.

This report was approved by the Council of the State Society and the Committee dismissed. This was followed by the appointment of a "Special Committee on Proprietary Schools in the Dental Specialties" in the First District Dental Society by the president, Dr. Clyde H. Schuyler, in 1939. The Committee consisted of:

Dr. Henry Sage Dunning—Oral Surgery
Dr. Earle Banks Hoyt—Prosthetics
Dr. Arthur H. Merritt—Periodontics
Dean Allen T. Newman—Educator
Dr. Alfred S. Walker—State Board Examiner
Dr. William J. Gies—Counsellor
Dr. Leuman M. Waugh, Chairman

The Committee was continued through the administration of President Harry M. Moss.

The Dental Society of the State of New York, through its president, Dr. W. Ray Montgomery, also appointed a committee entitled "Committee on Specialization to Confer with the State Board of Dental Examiners." A brief outline of the reports of these two committees and the action of the several bodies directly concerned will be presented.

A searching questionnaire* was prepared by the Committee and approved by the Directors of the First District Dental Society. This was sent to the four proprietary, commercial—operated for profit—schools, institutes, courses or clinics located in the First Judicial District. The following excerpts are from the replies received.

Institute of Orthodontia, 133 East 58th Street, New York City, Dr. Egon Neustadt, Director. Dr. Neustadt answered as follows: "My dear Doctor

*Questionnaire appended.

Waugh: The First District Dental Society's recent decision to bar from the pages of its Journal the announcement of the Institute of Orthodontia—despite its authorization from the Board of Regents—makes it evident that the Society's attitude in this matter is not unbiased. The Institute is, for this reason, constrained to decline answering the questionnaire. Yours very truly, (signed) Egon Neustadt."

Dewey School of Orthodontia, 17 Park Avenue, New York City, Dr. Harry Abelson, Director. Dr. Abelson turned the questionnaire over to his attorney, Nathan A. Goldenthal, who wrote: "I believe that an examination of the papers filed with the University of the State of New York will answer all of your questions and give you all the information which you desire to have. I believe that there is nothing that either my client or I can add to the material now on file with the Board of Regents."

New York School of Orthodontia and Oral Surgery, 36 West 59th Street, New York City, Drs. Morris I. Schamberg and Samuel Abraham, Owners and Teachers. Dr. M. I. Schamberg wrote as follows: "My dear Doctor Waugh: In response to the communication sent by your committee in reference to the postgraduate instruction of Oral Surgery which I have been giving dentists for many years, permit me to state that when we applied to the Regents for a license to conduct a Post Graduate School in Orthodontia and Oral Surgery we were confronted with obstacles which caused us to abandon the school idea and revert to private practice courses. These I give in my private practice and at the several hospital clinics that I attend. Trusting that this gives the desired information, Sincerely yours, (signed) Morris I. Schamberg."

Dr. Samuel Abraham wrote and sent an outline of his course in Orthodontics: "My dear Doctor Waugh: Answering your letter of April 27 and May 3, I would state that the N. Y. Post-Graduate School of Orthodontia and Oral Surgery has cancelled its announcements in the dental journals as of November 1, 1939. Since that time, graduate dentists have been accepted only as private students receiving personal instruction. Instruction is given at my office and laboratory and at the clinics that I am associated with. The enclosed bulletin describes in detail the scope of the post-graduate instruction given by me. Very truly yours, (signed) Dr. Samuel Abraham."

New York Orthodontia Preparatory School, 1240 Park Avenue, New York City, Dr. A. Lincoln Adelman, Director. Dr. Adelman answered under date of June 19, 1940, as follows: "As I am reorganizing my course during the summer, I will not be able to categorically answer the questionnaire." The following, from a letter sent by Dr. Adelman to an inquiring student (Dr. Samuel Ackerman, June 19, 1940): "I am pleased to state that Doctor Samuel Woolf, one of my first students of 119 West 57th St., Manhattan, has contracted for over nine times the amount paid me for instruction."

The fifth school of this class is located in the Second District and did not, therefore, come under the direct investigation of this Committee. It is known as the Griffin School of Orthodontia and does, however, come under the ruling of the Committee of the Dental Society of the State of New York and of the State Board of Dental Examiners and the Board of Regents of the University of the State of New York. The report of this Committee was unani-

mously approved and adopted by the First District Dental Society. It was ordered by resolution that the report be presented to the State Board of Dental Examiners and that a copy be sent to the Board of Regents. This was done at the annual meeting of the State Society held in Buffalo, May, 1941. I wish to quote from a letter, dated March 1, 1940, received from Dr. Frank P. Graves, Commissioner of Education of the State of New York: "Dear Dr. Waugh: I am in complete agreement with you that the proprietary principle should not obtain in any area of higher and professional education, and I look forward to the time, not far distant, when it will be possible for the Department to refuse to countenance the continuance of proprietary institutions such as these." The following is quoted from "Report of the Committee on Specialization to Confer With the State Board of Dental Examiners (appointed by President W. Ray Montgomery, Dental Society of the State of New York, June, 1940).

"Presented to the Executive Council at the Seventy-Third Annual Session, Buffalo, New York, May 13, 1941. The members of your Committee have undertaken the task assigned it with the avowed object of making a thorough study of conditions existing in the specialties of dentistry, and formulating suggestions that shall be alike for the best welfare of the public and members of the profession. For what is best for the people is best for the profession and conversely, what is best for the profession is best for the people, so mutual is the stake.

"Your Committee had a conference with the State Board of Dental Examiners by invitation on Dec. 2, 1940. All the members of the Committee were present. Doctors Franklin A. Squires and Glenn H. Whitson appeared for the New York Society of Orthodontists. A lengthy and important discussion took place. Dr. Milton E. Loomis, Associate Commissioner and Acting Assistant Commissioner for Higher Education of the University of the State of New York was present and took an active part. A special meeting of the Committee of the State Society was held with all members present on Dec. 2, 1940, following the conference with the State Board of Dental Examiners. A second meeting of the Committee was held Jan. 12, 1941. All members were present, including President W. Ray Montgomery and the following kindly attended by invitation: Charles A. Pankow, Chairman of Legislation Committee, Harlan H. Horner, Secretary of the American Dental Association's Council on Dental Education, Frederick D. Noyes, Allan G. Brodie, and Associate Dean Houghton Holliday. An earnest and friendly discussion lasting about three hours ensued. Many points of importance in guiding the Committee in its decisions were brought out. There has also been interchange of opinion among the members of the Committee by correspondence. The following expresses in concise form the consensus of opinion of your Committee:

"I. That dentistry covers so broad a field of practice that specialization becomes necessary for one to become expert in any one of a number of special branches.

"II. That in dentistry, as in medicine and surgery, the undergraduate student can be prepared for a safe beginning as a *general practitioner only* and that qualification for specialized practice must be acquired after graduation from the undergraduate dental school.

"III. That the outstanding of these at present seems to be: prosthetics, periodontics, certain parts of operative dentistry, pedodontics or dentistry for children, oral surgery, and orthodontics.

"IV. Special training for expertness in each of these must be engaged in as a graduate or postgraduate pursuit since it is impractical to compel all undergraduate students to acquire this for the D.D.S. degree.

"V. Of these, oral surgery and orthodontics stand out as more distinct and clearly defined specialties of dentistry. Oral surgery and orthodontics exact a breadth of fundamental knowledge in biology and a depth of judgment in its application to practice that demand close and orderly study for its mastery. This can best be acquired in a well-organized program under competent teachers in an institution adequately equipped with all necessary facilities for scientific study. Such opportunity is now being offered in leading universities through their dental schools and at a tuition fee considerably lower than that of the undergraduate student. Such courses are offered both on a whole-time and on an extended part-time studentship. The latter permits dentists to carry on half-time practice while taking the course.

"VI. Therefore, in oral surgery and orthodontics, applicants for qualification as exclusive specialists should be required to have made their preparation for specialization under university facilities and discipline. The State Board of Dental Examiners could (a) recognize the high quality of certain university courses, these being registered graduate courses and their graduates be accepted without examination, or (b) by examination embracing both fundamental science and clinical practice. For the latter, the office and the patients under treatment should be examined.

"VII. It is recognized that exclusive practice lends itself to larger centers of population and that in smaller communities some general dentistry is necessary in combination with special practice.

"Your Committee can see no harm in this so long as adequate preparation in the specialty as heretofore outlined has been made. The welfare of the patient must at all times be safeguarded. No dental or medical school has ever claimed to fully prepare its undergraduates for specialized practice. Therefore, any dentist practicing a specialty must prepare himself by graduate or postgraduate study. The commonly prevailing practice of dentists taking impressions and sending them to the dental laboratory for diagnosis and the making of corrective appliances is doing untold harm to countless hundreds of children in our very midst and cannot be too strongly condemned. It is illegal in New York and other states and must be stamped out as a duty of the profession to the public.

"As a principle, no practitioner in health services should attempt the treatment of abnormal bodily conditions which he is not competent to treat. The vexing question of furnishing specialized treatment to residents of smaller communities will remedy itself before long as a result of better highways being rapidly extended to remote districts, the more general use of automobiles and the increased facilities being offered by the university dental schools resulting

in the preparation of much increased numbers of well-trained and competent specialists, a proportion of whom will naturally take up practice in such communities.

"The State Board of Dental Examiners in making decisions as to those who are qualified to hold themselves out as specialists could receive much help by appointing from each of the two major specialties a competent member or a small committee of such specialists to assist in obtaining information as to the competence of the applicant. His credentials could be tabulated, his office visited, his methods of practice looked into and the results obtained upon his patients be evaluated. Competent, broad-minded specialists, conscious both of the welfare of the public and of the practitioner, would, we feel, easily be enlisted for this service and could supply reliable information that would be difficult to obtain in any other way.

"VIII. The problem of acceptable preparation for exclusive specialization and who shall be allowed to hold himself out as a specialist is now being well solved by our State Board of Dental Examiners. The statute which they are enforcing is being adopted by the ethics committee of our district societies and applied to the members in their respective districts. The action of the State Board is expressed in the following two letters which are included in this report by permission. Following the conference of our Committee with the State Board of Dental Examiners, President W. Ray Montgomery received the following letter, under date of Jan. 2, 1941, from Minor J. Terry, Secretary:

" 'After thorough discussion

'On motion it was voted that a reinspection of postgraduate schools of orthodontia be requested, and the report be sent with certain recommendations to the department, before any permits are issued to such postgraduate schools.

'On motion it was voted that the Board of Dental Examiners recommend to the Regents that all postgraduate schools of orthodontia be required to consummate an organic connection with a registered and approved university.

'On motion it was voted that a copy of this resolution be sent to the Executive Council of the State Society.'

"Excerpt from letter from Minor J. Terry, Secretary, under date of June 16, 1937:

" 'In reply to your letter of the 14th instant, beg to advise that all "ballyhoo" signs made use of by a dentist in general practice such as "Teeth Straightened," "Pyorrhea Treated," "Removable Bridgework," etc., are prohibited under the Statute whether such statements are advertised on "milk signs" or displayed on the windows. However, a man who confines his practice exclusively to Orthodontia or any other specialty in dentistry, should be permitted to announce this fact upon his signs, but the general practitioner who attempts to solicit patronage by attempting to indicate that he is specializing in any branch of dentistry, would be misleading and deceptive and, therefore, would be prohibited under the Statute. I would appreciate it if you would send me the

names and addresses of any dentists who are violating the law with respect to the displaying of the above mentioned signs.'

"In conclusion, your Committee wishes to congratulate our Society and to express our full appreciation to the State Board of Dental Examiners for the enforcement of a Statute which safeguards the public welfare as fully as do any of the newly enacted laws by several states for defining the specialties and for safeguarding their proper practice.

Respectfully submitted,

April 10, 1941

Leon L. Abbey
Russell W. Groh
Harold J. Leonard
Bernard G. Wakefield
Leuman M. Waugh, Chairman"

The present status of all proprietary schools in orthodontics in the State of New York is made clear in the following:

"ACTION OF BOARD OF REGENTS, FEBRUARY 21, 1941

"Voted, That the authorizations granted to The Dewey School of Orthodontia, New York, and the Griffin School of Orthodontia, Brooklyn, to advertise and transact business as schools of orthodontia, be extended to March 1, 1942,

and

"Voted, That the authorization granted to the Institute of Orthodontia, New York, to advertise and transact business as a school of orthodontia, be limited to March 1, 1942,

and

"Voted, That after March 1, 1942, all postgraduate schools of orthodontia be required to establish an organic connection with registered and approved universities."

We feel that genuine progress has been made in the State of New York in Orthodontic Education and the Recognition of Orthodontics and the other Specialties in Dentistry. We trust this information will be gratifying to all our members and especially so to those practicing in this State. We hope it may serve to encourage and stimulate effort to similar ends among those residing in other states. May success crown their labors so that forthright orthodontics as a specialty of dentistry can make true progress and safeguard the welfare of the children of all the people who desire orthodontic service.

INFORMATION DESIRED BY THE FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

Special Committee appointed by the President:

Henry Sage Dunning
Earle Banks Hoyt
Arthur H. Merritt
Allen T. Newman
Alfred Walker
Leuman M. Waugh, Chairman
William J. Gies, Counsellor

N. B. Where the space available for replies is insufficient, attach notes, lists, etc., to supply the needed room for complete responses.

Name:

1. Name of school (this implies course, clinic, institute, college, etc.)

Address:

2. (a) Address of school:
   (b) Address of the actual owner, i.e. person or persons financially responsible for the maintenance of the school:

Building:

3. Nature of building: (a) Office:
   (b) Apartment:
   (c) Commercial:
   (d) Educational:
4. Neighborhood: (a) Commercial:
   (b) Residential:
   (c) Educational:
5. Is the school in the same building with the "private practice" offices of owners or teachers:
6. If so, what is the geographic relationship of private office or offices and school:
7. How long has the school been in operation:

Equipment:

8. Approximate floor area used for teaching and clinic purposes:
9. Portion fitted for: (a) Lectures:
   (b) Laboratory facilities:
   (c) Clinic purposes:
10. Approximate size and equipment of:
    (a) Lecture rooms (seating capacity, blackboard, projection apparatus, etc.):
    (b) Laboratory facilities (indicate bench space for ---------- students and facilities for individual work and teaching):
11. Number of dental chairs in the clinic:
12. Additional equipment in the clinic:
13. Facilities for the teaching of such basic sciences as anatomy, histology, physiology, etc.:
14. What is the percentage of time of total course devoted to the study of such basic sciences for each subject:

General Relationships:

15. If the school is affiliated with a dental college name the latter:
16. Is the school a nonprofit institution:
17. Profits go to whom:
18. Give name or names of the owner, owners, or stockholders:

Staff:

19. Give the names of the teachers, instructors and demonstrators on the staff; and specify the nature of the instruction given by each:
20. Indicate their professional degrees:
21. Indicate their special training and where obtained:
22. Give a list of all instructors in the clinic:
23. Give proportion of weekly time devoted by each to teaching in the school:

Instruction:

24. Indicate the length of the course or courses:
    (a) Number of weeks of instruction:
    (b) Number of days of instruction per week:
    (c) Number of hours of instruction per day:
25. Give a detailed list of didactic courses:
    (a) Each subject:
    (b) Number of lectures:
    (c) Length of each lecture:
    (d) Names of the teachers in each subject and of their assistants, if any:
    (e) Give time actually devoted to teaching in this school per week: ----------; per year: ----------.

26. State the number of hours devoted to dissection and to microscopic laboratory work, and indicate the facilities provided:
27. What are the requirements for the completion of the course:
28. Is a certificate or printed or written statement of any kind given at the completion of the course:
29. If so, in what form or forms:
30. How many dentists are enrolled for the course now in progress:
31. Present lists of the names and addresses of those who completed courses in 1938 and in 1939:

Patients:

32. (a) How are the clinic patients obtained:
    (b) Are such patients applying for service occasionally or frequently referred to a private office for treatment:
    (c) If so, what office or offices:
    (d) How many patients were so referred in 1939:
33. What is the roster of fees for clinic patients:
34. By whom are these fees collected:
35. What disposition is made of these fees:

Tuition:

36. State the total amount of tuition per student for the course or courses:
37. When is payment of tuition due:
38. To whom is it payable:

Library:

39. Indicate the nature and scope of the library associated with the school, for reference and other uses by the students:

Supplementary Information:

40. Has any person not named in the questionnaire any fundamental interest in the school either as employee or financial agent:
41. Additional facts of interest:

Date ---------- (signed) ----------

Please return this form, with responses, to

Leuman M. Waugh, Chairman
576 Fifth Avenue
New York City

SIMULTANEOUS DISTAL MOVEMENT OF MAXILLARY AND MANDIBULAR BUCCAL SEGMENTS

B. Edwin Erikson, A.B., D.D.S., Washington, D. C.

THE role played by excessive mesial drift of teeth, both maxillary and mandibular, in producing malocclusion has been discussed by various students of the orthodontic problem—among them Grieve,[1] Atkinson,[2] Downs,[3] and Tweed.[4] All of them have described various techniques designed to meet the resulting problem in treatment.

One of the types of malocclusion in which mesial drift is a probable etiologic factor is that in which the teeth are crowded into malalignment. This type is found in each of the three great classes into which Angle divides all malocclusion.

In the past the routine method of treatment for this crowded condition of the teeth has been widening of the arches, spoken of as expansion. There are, however, several objections to expansion. Long ago Lundström pointed out that when expansion of the arches results in placing teeth in positions off the apical base, the procedure is fallacious and the results temporary; and more recently Atkinson has pointed out that if teeth moved into positions off the apical base are placed in correct axial positions their buccal roots may *ipso facto* protrude through the cortical plates of bone. Moreover, from the esthetic standpoint, the "toothy" appearance of many patients treated on that principle is another indication of fallacy. So we are forced to recognize that expansion (in the sense of widening) is not the complete answer to the problem of treating crowded arches.

Some of our most capable orthodontists, recognizing the truth of Lundström's observations, have shown the courage to leave the beaten trail of expansion, and in order to meet the problem of correcting crowded arches and other conditions in which the teeth have migrated anteriorly have resorted to extraction of premolars. By this means they have succeeded in keeping the teeth within the confines of the apical base and have produced results that are stable, functionally efficient, and highly satisfactory from the esthetic standpoint. But again extraction is not a complete answer to the problem—for, as Atkinson has shown after studying a mass of anatomic material, if the first molars are left in positions anterior to the key-ridge, the narrow space between the cortical plates in this anterior position causes the mesiobuccal root of the first molar to protrude through the cortical plate. Another objection that might be made against the method of extraction of premolars is the question whether the contacts between the teeth subsequently moved into approximation through the space thus left are ever as efficient as those we might have had if the continuity of the arch had never been disturbed. In removing a first premolar, for example,

Presented before the Washington-Baltimore Society of Orthodontists, Dec. 5, 1941, and supplemented by Dr. Spencer Atkinson's motion pictures illustrating his appliance construction and result of its use.

the trans-septal fibers of the periodontal membrane are severed between cuspid and first premolar on the one hand and between first premolar and second premolar on the other. It is hoped that when the cuspid is moved into approximation with the second premolar the severed trans-septal fibers will either be reunited or else be replaced by a new set of fibers running from cuspid to second premolar; but whether or not this occurs has not, so far as I know, been demonstrated histologically. Clinical evidence seems to leave the matter in doubt. If these trans-septal fibers do fail to unite or re-form, we should not expect ever to have normal "snappy" contact between the teeth moved into approximation. So while extraction solves some of the important problems created by mesial drift, it seems desirable so to perfect our methods that this resort will be unnecessary.

More recently discussion of meeting the problem created by mesial drift has centered upon the possibility of moving the buccal segments distally; and working to this end, various techniques have been described. With all of them the amount of distal movement obtainable is more or less limited. Hence, in a case involving mesial drift to the extent of the full width of a premolar, it is doubtful whether the entire amount of the lost space can be recovered by distal movement. So again, with the technique of distal movement so far evolved, we are forced to admit that in some cases this method also is not the complete answer. However, in a large number of cases the amount of distal movement afforded seems to be adequate to retain the teeth within the confines of the cancellous bone between the cortical plates and to insure greater stability of final results.

In the following discussion a technique will be described for accomplishing distal movement by means of the universal appliance, the essential principles of which are the same as those described by Downs for the edgewise mechanism, although as might be expected the practical details of application of the principle differ materially. The basic principle of the technique described by Downs is to effect the distal movement of one tooth at a time on each side of the arch, commencing with the most posterior erupted tooth, and to utilize as anchorage all the remaining teeth within the same arch. Downs seems to confine the technique to the mandibular arch. In the following description it should be understood that the technique is applied to maxillary and mandibular arches simultaneously, if indicated.

Imagine, if you will, a denture, either upper or lower, in which all teeth have erupted except the third molars. Imagine such a denture carrying a universal appliance with bands on all of the teeth except the second molars, and with an arch wire seated passively in all of the attachments. Place on the arch wire, between the first molar and the second premolar, a coil spring contracted one-third to one-half its length (Fig. 1*A*). Leave the appliance untouched for a period of eight to twelve weeks. At the end of that time there may or may not be a space between the first molar and second premolar (Fig. 1*B*). If there *is* a space, it will in all probability amount to not more than one millimeter.

Now imagine another but similar denture with a slight rearrangement of the appliance (Fig. 2*A*). Bands are now carried by all of the teeth, including the second molars, and the arch wire is in the same passive state as in Fig. 1*A*.

Between the first and second molars place a coil spring contracted likewise one-third to one-half its length. As before, leave the appliance untouched for a period of eight to twelve weeks. At the end of that time, in all probability, there will be a space between the first and second molars perhaps two millimeters in breadth, perhaps even as much as four millimeters (Fig. 2*B*).

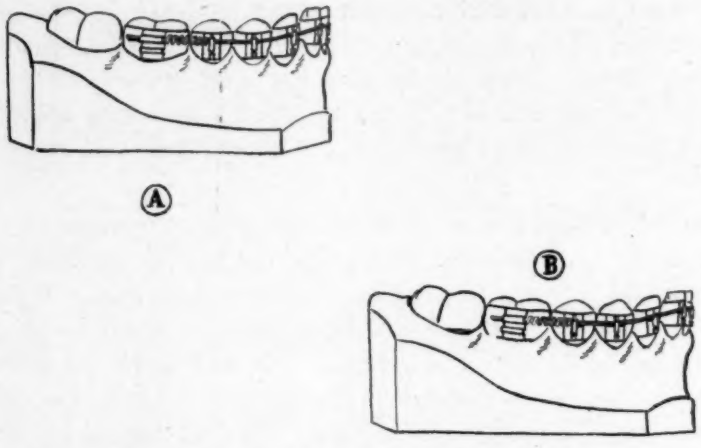

Fig. 1.—*A*, Arch wire seated passively in all brackets. Coil spring contracted one-third to one-half its length and placed on arch wire between bracket of second premolar and sheath of first molar. *B*, After eight to twelve weeks there is little or no space between first molar and second premolar.

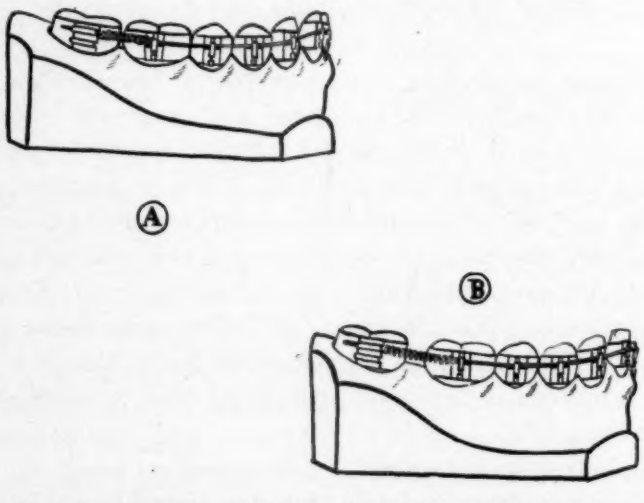

Fig. 2.—*A*, Arch wire seated passively in all brackets. Coil spring contracted one-third to one-half its length and placed on arch wire between bracket of first molar and sheath of second molar. *B*, After eight to twelve weeks a space two to four millimeters in breadth appears between first and second molars. Deduction: Considering Figs. 1 and 2 together, space between first and second molars in Fig. 2*B* was gained mainly by distal movement of second molar.

This demonstration seems to give rather persuasive clinical proof that in the second arrangement of the appliance the principal effect of the coil spring is to produce a distal movement of the second molar, for if the space between the first and second molar in Fig. 2*B* was gained at the expense of mesial movement of the teeth anterior to the spring rather than as a result of distal movement of the second molar, then it would follow that in the arrangement shown in Fig. 1*B* the space between the second premolar and first molar should have

been greater than the space between the first molar and the second molar in Fig. 2*B*, since the resistance to mesial movement of the teeth anterior to the spring was considerably less in Figs. 1*A* and *B* than in Figs. 2*A* and *B*.

On the basis of evidence afforded by this simple experiment, it is believed that the technique set forth below may be expected to accomplish distal movement of buccal segments at least in some degree.

To begin then with the description of the technique, bands carrying single brackets are placed on all of the teeth except the last molar present on each side, which should have bands carrying .020 double buccal sheaths. The reason for specifying single brackets is the need to eliminate every vestige of resistance to sliding of the teeth along the arch wires. The reason for an .020 double buccal sheath, rather than an .030, will appear later.

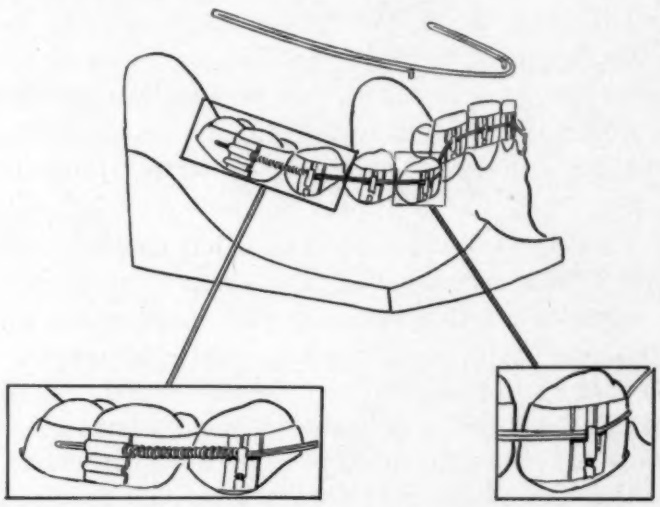

Fig. 3.—Round wire .012 inch in diameter seated passively in all brackets. Coil spring contracted one-third to one-half its length is placed between bracket of second premolar and sheath of first molar. Round wire is doubled back upon itself to permit forming a stop immediately mesial to the cuspid.

On the teeth thus banded is placed an .012 round arch wire, doubled back upon itself to form a stop as shown in Fig. 3, and locked in the *occlusal* slots of the brackets. The stop on the arch wire serves to prevent relative mesial movement of the teeth posterior to it in the event there should be a tooth mesial which is blocked out or unerupted. Thus, if a cuspid, for example, is not erupted sufficiently for banding, the stop is placed on the first premolar; or to take another example, if the lateral is crowded too far lingually to be included in the arch attachments, the stop is placed at the cuspid. To serve its purpose the stop must lie precisely against the mesial aspect of the bracket of the tooth which is stopped. It is therefore formed after the arch wire has been seated and pinned to place. This is accomplished by leaving the doubled-back portion of the wire longer than necessary and simply bending it gingivally at the bracket *after the arch wire has been pinned to place,* the pin in the stopped tooth being then removed and the arch wire lifted out of the bracket sufficiently to snip off the surplus portion of the wire.

Before seating and pinning the arch wire to place, a coil spring is placed between the last tooth and the next tooth anterior as shown in Fig. 3. The

spring is cut to such length that when contracted by one-third to one-half its length, it will just fill the space between the attachments.

At this initial stage of treatment it is positively necessary to omit the lingual arch wire, for it not only destroys the freedom of movement that must necessarily be enjoyed by the molar if the tooth is to be actuated by the delicate force of the spring, but also it actually serves to maintain the molar in an anterior position by reason of the pressure of the tongue upon its anterior portion. Because so much of the tooth movement in this plan of treatment must thus be executed without a lingual wire to stabilize the molars, it is desirable to use the .020 size of molar sheath, this size of sheath enabling the labial wire to maintain adequate molar control with respect to both rotation and tipping. In omitting the lingual arch wire at this stage, there need be no misgiving as to whether width between the distally moving molars will be increased to compensate for the increased width of mandible and maxilla as the posterior regions are approached, since in the absence of a restraining force the natural tendency of the molars is to remain in the cancellous channel of bone, and this tendency, far from being thwarted, is actually helped by a properly shaped labial wire, however light.

In the form above described the appliance is left untouched until the molars have accomplished a distal movement of two to four millimeters (Fig. 4). The length of time required for this extent of movement varies widely from individual to individual. With some it may occur in as short a time as eight weeks; with others it may require twelve or sixteen weeks. When the required amount of space has developed, a radical change is made in the arch wires, the purpose of which is to remove the distal pressure upon the molar, lock the tooth in its distal position and at the same time prevent any further change in the total length of the arch from terminal tooth on one side to terminal tooth on the other. In other words, the next step is to "freeze" the new extended arch length gained through distal movement of the molars, while the remaining buccal units are moved distally one at a time within the confines of the new arch length and within the cancellous bone.

So the round arch wire is discarded and in its place is substituted a flat wire .008 by .028, the .008 thickness being selected to facilitate sliding of the brackets along the arch wire. By means of a tang at the sheath of the last banded molar on each side and a crimp opposite each lateral incisor (Fig. 5) this flat wire serves to maintain the new length of arch against collapse while the remaining buccal teeth are being moved distally, one at a time on each side. The crimps and the tangs must be placed with absolute precision, for the slightest play between crimp and bracket or between tang and sheath will result in a corresponding loss of arch length, while any excessive tightness at the two points will result in displacement of the incisors anteriorly—a condition we wish to guard against with the utmost care. To attain this required precision the following procedure has proved effective.

The .008 by .028 flat wire is passed through the buccal sheath of the left molar to a distance of approximately two centimeters beyond the distal end of the sheath. In doing this it is usually necessary to manipulate the wire or cheek

or both to prevent pricking of the mucous membrane by the end of the wire. The wire is seated temporarily in the brackets of the teeth on the left side as far as the left lateral incisor, where a pencil mark is made opposite the bracket. The arch wire is removed and at the pencil mark a crimp is placed in the wire, sufficiently large to prevent movement through the bracket. Placing this

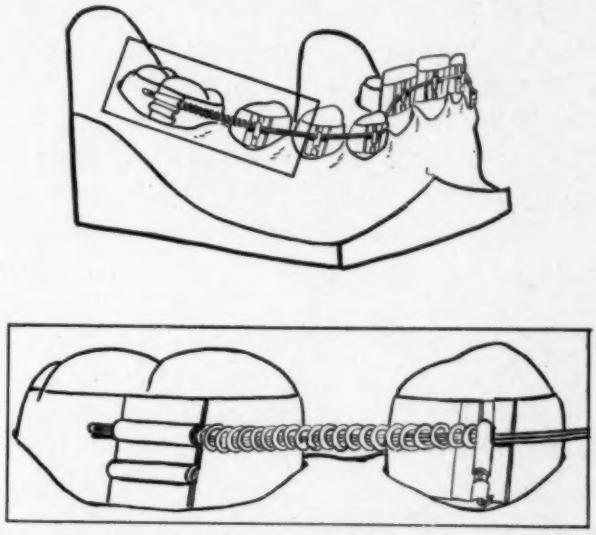

Fig. 4.—After a varying period, probably between eight and sixteen weeks, the molar will have moved distally a distance of two to four millimeters.

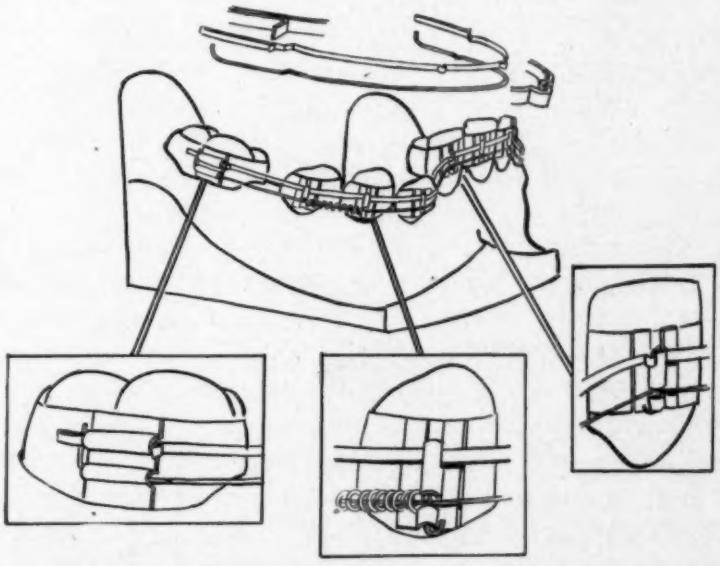

Fig. 5.—Arch wires rearranged. A flat wire (.008 by .028) seated in the occlusal portions of the brackets carries a tang at the last banded molar on each side and a crimp opposite each lateral incisor; this wire locks the molar in its new distal position and prevents collapse of the arch while remaining buccal teeth are moved distally one at a time. The round gingival wire (.012) carries a coil spring for distal movement of second premolar; it is locked at molar to prevent anterior movement of teeth mesial to spring.

crimp snugly against the left lateral bracket, the wire is seated in all the incisor brackets and a pencil mark made opposite the right lateral incisor bracket. The wire is removed and a crimp placed opposite the new pencil mark. When the wire is replaced in the incisor brackets, the two crimps should lie snugly against

their respective brackets, permitting no play either to right or to left and yet exhibiting no binding either, since the slightest tightness will certainly result in displacement of one or more of the incisors. The right end of the wire is cut to approximate length by laying off a distance from right lateral crimp distally equal to the distance from the left lateral crimp to the left extremity. The wire is again passed through the left molar sheath and seated in all of the brackets of the left side and also in those of the incisor brackets. Pencil marks are made on the wire indicating the mesial and distal margins of the buccal sheath, and the wire is withdrawn.

About three millimeters anterior to the mesial mark on the wire a sharp offset bend is made in a buccolingual direction as shown in the upper insert of Fig. 5. This bend (1) compensates for differences in width between molar and premolar and also serves (2) as a point from which to make a bend for the control of molar rotation, and (3) as a point at which to incorporate the degree of torque necessary to accommodate the arch wire to the taper of the buccal surface of the molar. About three millimeters distal to the distal pencil mark on the wire, the wire is doubled back sharply upon itself to form a double wire. At the point of sharp bend the wire must obviously be annealed.

The above procedure is repeated on the right side and the arch wire pinned to place exactly as it is to remain for the ensuing steps of the distal movement of the segments. The arch wire pinned to place, the free ends of the recurved portion are bent outward against the buccal sheaths to commence the formation of the Atkinson tang. The arch wire is removed, the tangs are completed and smoothed, and the arch wire is given the form of the Hawley arch, using a size several numbers larger than the one for which the teeth actually measure.

The flat or occlusal arch wire is now completed. It remains to form the round gingival wire. Just as the flat occlusal wire maintains the arch against collapse the round gingival wire is made to fix the arch against any further extension or lengthening as the buccal units are moved distally by coil springs. The forming of the gingival wire may be passed over with a mere statement that it is formed of .012 round wire, with crimps placed opposite the lateral incisors and offset bends anterior to the first molars.

The two arch wires, the flat occlusal and the round gingival, are pinned to place, and while doing so two coil springs are slipped upon the gingival wire, to occupy positions between first and second premolars on each side, the springs being cut to such length that when the arch wire is seated they will be compressed approximately one-third to one-half their length. If there is any unit in either buccal segment that has not been attached to the arch wire by means of a band, either because it is insufficiently erupted or because it is so far out of line that it cannot be included in the path of the arch wire without a sharp bend, the space of that missing unit must be maintained with an additional coil spring. This additional coil spring, however, is cut of such length as to just fill the space of the missing unit snugly, but exert no pushing force on either of the teeth it approximates.

As a last step after the final pinning of the arch wires, the round gingival wire is given a sharp bend occlusally immediately distal to the molar sheath,

the wire being drawn tightly between the flat occlusal wire and the band. The gingival wire is then cut off snugly at the occlusal edge of the flat wire, as shown in the lower insert of Fig. 5. It is most important that the gingival wire should be thus locked tightly distal to the molar sheath as will be seen later.

At this stage the lingual arch wire is still omitted.

An appraisal of the situation at this point may serve to clarify what we plan and expect to accomplish with arch wires as we have now arranged them. First, we have moved back the most distal unit of the buccal segment on each side of the arch, and by means of the flat occlusal wire carrying tangs and crimps we have locked it in this distal position. We now propose to move distally the remaining units of the buccal segments, one at a time on each side, employing for this purpose a coil spring. This coil spring, moving one tooth at a time, will have its force of reaction limited by the entire remaining portion of the arch, *including the last molar present,* which has just been moved distally. Since the coil spring, as it moves each unit distally, places a mesially acting force on all units mesial to itself, it will naturally tend to produce further extension or lengthening of the arch unless this force of reaction is resisted. This resistance is to come from the round gingival wire, which, after pinning, has been locked as shown in the lower insert of Fig. 5. Thus while the flat wire fixes the arch against collapse and the round wire fixes it against further lengthening, the coil springs will accomplish distal movement of second premolar, first premolar and cuspid, one at a time, into the space created when we first initiated distal movement of the molar, and in doing so will have their mesial force of reaction resisted by the entire arch excepting only the single teeth on which they exert distal pressure.

With the arch wires arranged as shown in Fig. 5, a period of four to eight weeks will usually suffice to see the second premolar in contact with the first molar, as shown in Fig. 6. A ligature may be passed from second premolar to first molar to retain these units in approximation during the next step, as shown in Fig. 7. Usually, however, there seems to be no tendency for this contact to reopen once it has been closed as in this procedure; so the ligature is used only seldom.

The next step is to apply the coil spring to the first premolar. Without removing the arch wires, the lock pin is withdrawn from the first premolar bracket, the round gingival wire lifted gently from the slot, and the coil spring slid along the wire to the position shown in Fig. 8, after which a pin is replaced in the vacant bracket.

Again we mark time pending distal movement of the first premolar, which may be expected to occur in approximately the same period of time consumed in the distal movement of the second premolar (Fig. 9).

This brings us to the cuspid, and here a modification of the preceding technique may or may not be necessary. Usually the same procedure will be effective, that is, unpinning the cuspid, lifting the gingival wire from the slot, sliding the coil spring to a position between lateral incisor and cuspid, and then repinning the cuspid. If, however, the turning of the corner of the arch imposes

too much resistance to the push of the coil spring, it is possible to apply not only a push but a pull as well, both forces acting simultaneously, thus:

The round .012 gingival wire is removed and in its place is substituted a .006 round gingival wire, with coil springs occupying positions between lateral incisor and cuspid. This arrangement supplies the pushing force. The pulling force is applied in a manner suggested by Nagamoto, consisting of a second .006 round gingival wire extending from cuspid to last banded molar, into which wire is incorporated, integral with the wire, a coil spring of 10 to 15 turns (Fig. 10). This second gingival wire, incorporating the coil spring integral with itself, we shall designate, for the sake of convenience, as a contractile gingival

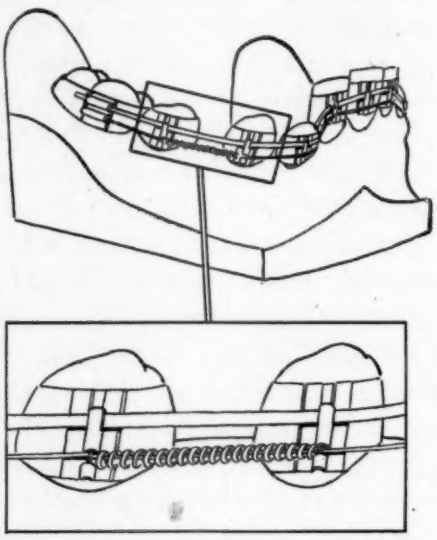

Fig. 6.—After a varying period, probably between four and eight weeks, the second premolar will have moved into approximation with the molar.

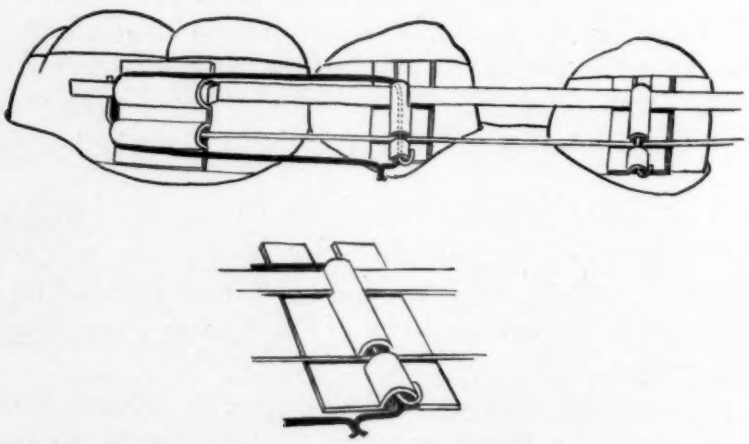

Fig. 7.—A ligature may be passed from second premolar to first molar to retain these units in approximation during the next step. It is usually unnecessary.

segment. It is fastened at the cuspid as shown in the enlarged insert (Fig. 10), and, together with the main gingival wire, passes through the buccal molar sheath and is pinned into the gingival slots of the premolars. After being passed through the buccal sheath, the contractile gingival segment is left with

considerable excess to enable the operator to grasp the end with pliers and stretch the segment just before locking the end under the flat occlusal wire (Fig. 11*A*), after which it is cut off close to the margin of that wire. In order to lose none of the contractile force of the segment, it is important that the locking of the wire at the molar sheath should be accomplished securely and without play. The contractile gingival segment is therefore locked first, and the main gingival wire locked behind it (Fig. 11*B*).

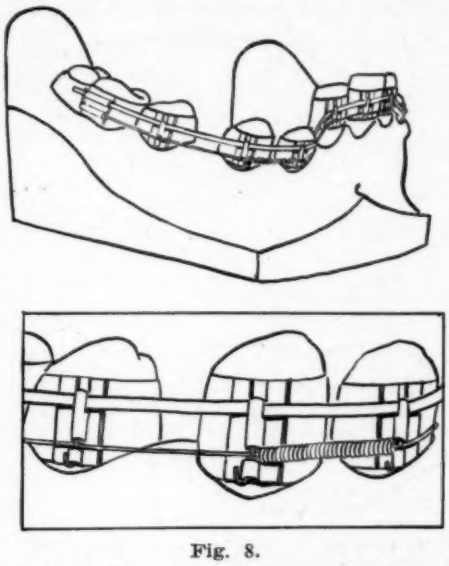

Fig. 8.

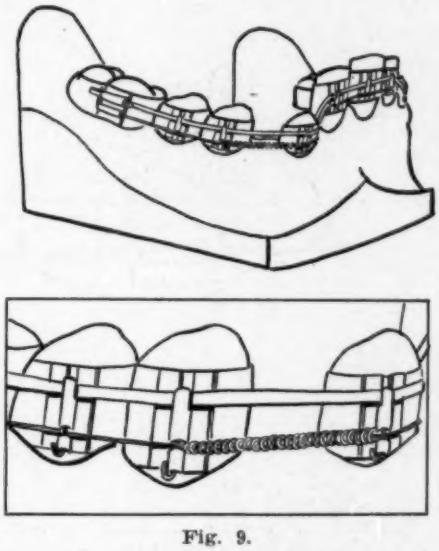

Fig. 9.

Fig. 8.—The coil spring is transferred to the first premolar without removing arch wires.

Fig. 9.—The first premolar moves distally in about the same period of time consumed in distal movement of second premolar.

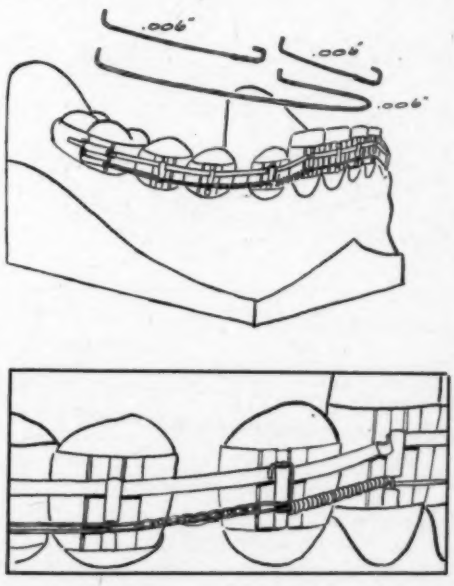

Fig. 10.—If the cuspid offers resistance to turning the corner, it will usually respond promptly when subjected to both a pushing force and a pulling force, acting simultaneously. The pulling coil spring is integral with an auxiliary gingival segment ("contractile gingival segment").

The distal movement of the cuspid is accomplished readily (Fig. 12) but will often require more time than did either of the premolars.

If the initial step of distal movement of the last molar (Figs. 3 and 4) was carried out adequately, there will now be sufficient room to align the incisors, with no strain whatever on the thin labial plate of bone. If the room available for the incisors is not sufficient, the entire process must be repeated; if there should be a slight excess of room the situation is readily managed by a rearrangement of the wires, thus:

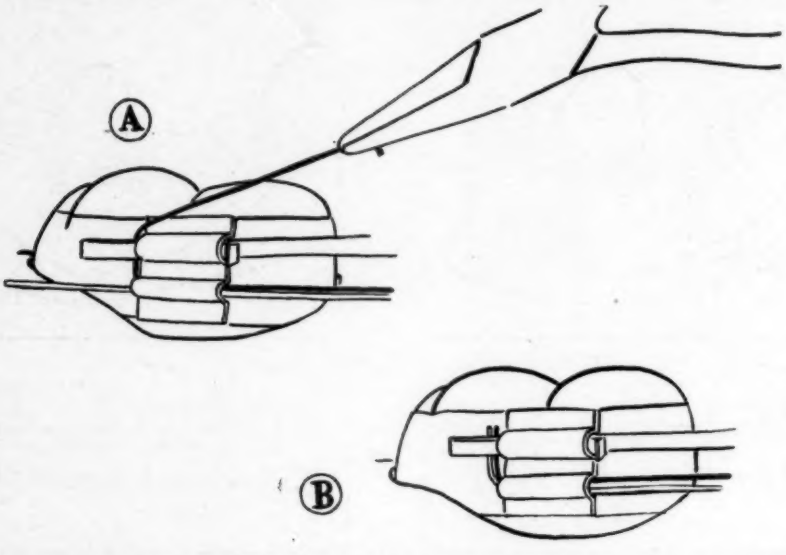

Fig. 11.—*A*, After being stretched with pliers the contractile gingival segment is locked at the molar sheath under the flat occlusal wire. *B*, The contractile gingival segment is locked first, leaving the main gingival wire to be locked behind it.

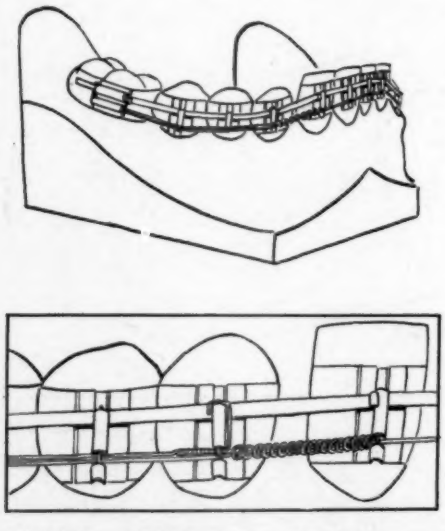

Fig. 12.—The cuspid moves distally readily, but often requires more time than does either of the premolars.

Both the flat occlusal wire and the round gingival wire are removed. The round gingival wire is discarded, to be replaced by another, which will be described later. The flat occlusal wire is retained, after first cutting off the tangs which have served as stops at the molar sheaths (Fig. 13). In cutting off the tangs the entire doubled-back portion is removed, in order that there may be

only a single thickness of wire in the sheath, thus providing for free sliding of the arch wire in a distal direction.

For the new gingival wire we use an .010 round wire, into which is incorporated just distal to each lateral incisor bracket a coil spring integral with the wire (Fig. 14). The coils should be wound quite closely and the number used should be proportioned to the space available between the brackets of the lateral and the neighboring cuspid. The greater the number of coils the greater, obviously, will be the recovery power of the spring; on the other hand, however,

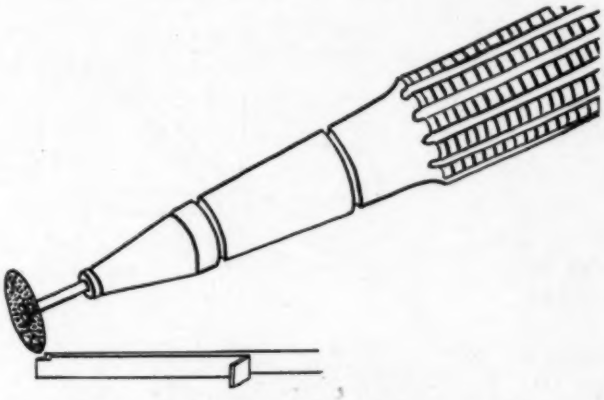

Fig. 13.—As a preliminary to posterior movement of the incisors, the extremities of the flat occlusal wire are cut to remove the tangs that have served as molar stops and also to leave a single thickness of flat wire in the molar sheaths.

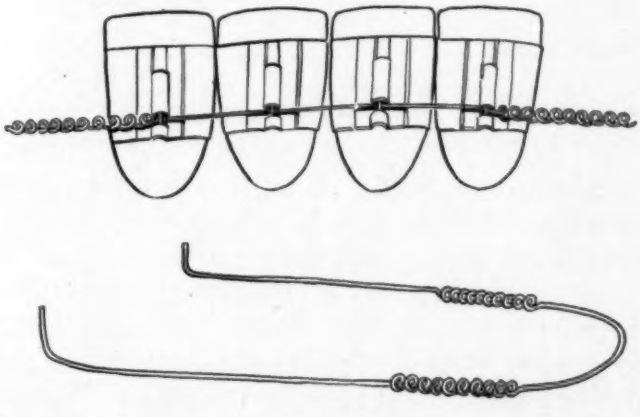

Fig. 14.—A contractile gingival wire supplies the traction to move the incisors posteriorly.

the greater the number of coils the less the distance available through which the spring may be stretched. The coils should, therefore, commence quite closely to the lateral brackets, so that no precious space will be lost through play at these points. Looking ahead and imagining the lateral in contact with the cuspid, the space available for coiling will be not more than two-thirds of the free space between the brackets. This amount of space should accommodate not less than ten coils of wire—the smallest number that can be used efficiently. If the number of coils that can be accommodated is less than ten, it would be better to drop to a smaller size of gingival wire—.008 or .006 (hard drawn)—than to reduce the number of coils.

For the sake of clearness we shall henceforth refer to this coiled gingival wire as a contractile gingival wire.

When the modified flat occlusal wire and the contractile gingival wire have been seated and pinned to place, each extremity of the gingival wire, in turn, is grasped with a pair of pliers, and the wire is drawn distally until the coiled portion has been stretched almost to the limit of its recovery power. Then, just as with the previous gingival wire, the end is locked by bending it sharply occlusalward immediately distal to the molar sheath and between the flat occlusal wire and the band, and the excess cut off close to the occlusal edge of the flat occlusal wire (Fig. 15).

The lingual arch wire is still omitted.

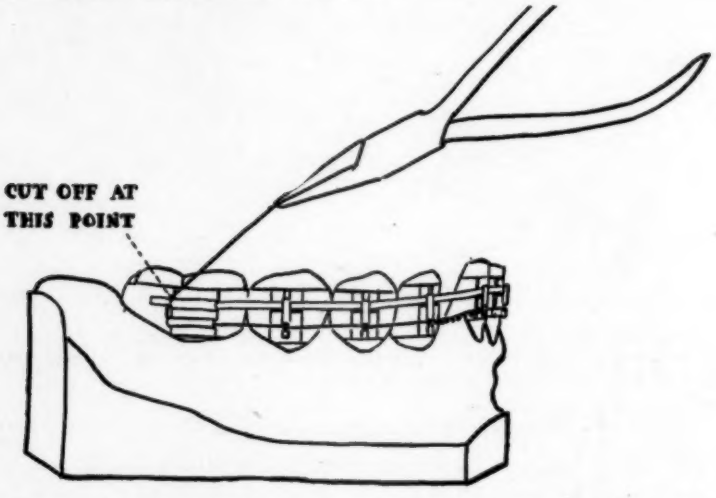

Fig. 15.—With both the flat occlusal wire and the round gingival wire seated in the sheaths and brackets, the gingival wire is stretched with pliers close to the limit of its recovery power.

The effect of this arrangement of the wires is to exert a light, steady distal pull on the four incisors, with the reaction from the pull resisted by the molars, premolars and cuspids, en masse. As the incisors move distally, the shortening of the gingival wire obviously occurs over the coiled portion between lateral and cuspid brackets (Fig. 15). Hence the distal movement is not in the least hampered by any possible binding of the gingival wire in the slots, the position of this wire in relation to all the slots being the same at the instant of locking as at the time when, the force of the coiled portion having been expended, this portion has returned to its original contracted length. With respect to the flat occlusal wire, however, the situation is otherwise. Here the wire remains stationary in the brackets of the incisors, while in the brackets of the cuspids and premolars and in the sheaths of the molars it must be free to slide distally to the accompaniment of the contractile action of the coiled portion of the gingival wire. Any binding of the flat occlusal wire, therefore, must be strictly avoided, and for this reason we insist at this stage on the thinnest flat wire practicable—.008 by .028.

With a lapse of three weeks, the contractile force of the gingival wire will be spent. It is then renewed by grasping the end with pliers, stretching it as before, and cutting off the new excess. If a pair of smooth-beaked Goslee's

Crown Pliers (No. 785) is used for this purpose, the operation can usually be performed without unlocking the gingival wire, since these pliers will usually take hold of the tiniest excess of gingival wire that may be protruding above the edge of the flat occlusal wire.

The stretching of the contractile gingival wire is thus repeated at intervals of three weeks until the lateral-cuspid spaces are entirely closed (Fig. 16). This completes the rough alignment of the teeth, and roughly their proper placement on the apical base. There now remains to be carried out the more accurate positioning of the molars, perhaps a little expansion, perhaps reduction of overbite, perhaps some torquing, perhaps some changes of relationship of arches calling for intermaxillary force, and other details. For this purpose the labial wires, both occlusal and gingival, are exchanged for larger sizes—.010 by .028 for the flat wire and .012 for the round wire—and for the first time the lingual wire is inserted.

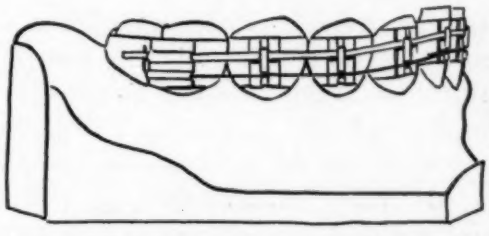

Fig. 16.—Three or four stretchings of the gingival wire at intervals of two weeks will usually effect complete closure of the space between the cuspid and the incisors.

From here on the treatment is routine, and will often be improved by the use of occipital anchorage. It will usually be found, however, that somehow along the way most of the problems involved in treating narrow and crowded arches have disappeared. There will be, for example, little if any need for expansion, a deep overbite will have materially reduced itself, and even moderate rotations may be partially aligned.

A few notes and the description of this particular phase of universal technique is concluded. If the case is at a stage where second molars have erupted sufficiently for banding, the .020 double buccal sheath is placed on these teeth, while the first molars carry brackets. These brackets on the molars, moreover, must be single. In fact, double brackets are used nowhere in this technique, since they interfere with the free sliding of the teeth along the arch wire. Even in the case of the maxillary central incisors, where it might be thought they would offer no interference, it sometimes happens that we will wish to move the teeth across the median line, an operation in which the double brackets would prevent free sliding.

If bands are placed on both first and second molars, the sheaths for the lingual arch wire are usually placed on the first molars. Further, in the case of bands on both first and second molars, after the buccal segments have all been moved distally, the bracket on the first molar may be replaced with a double buccal sheath and the labial wire accordingly shortened.

Regarding size of pins, the standard size (large) is used throughout except on the single teeth being moved distally by the coil springs, where the intermediate size of pin is used to facilitate sliding.

To attain the full possibilities of this technique of distal movement it is necessary to give meticulous attention to details, remembering on the one hand, that the slightest play at stops (tangs and crimps) means loss of previously gained distal movement, and on the other hand, that the slightest tightness at these points means anterior displacement of incisors rather than distal movement of molars. Constant care must be taken also, to see that the gingival wire is kept securely locked at the most distal banded molar, for without this locking the coil spring in moving a buccal unit distally serves also to displace everything mesial to it in an anterior direction, and accomplishes this undesired anterior displacement the more readily as the anterior part of the buccal segment is reached.

Theoretically it should be possible by this method to carry out the complete treatment of a case with round wires alone. Practically, however, it has been found that a round wire in the occlusal portion of the brackets is inadequate for any part of the distal movement except the initial step, that is, the distal movement of the last molar present. The round wire in the occlusal portion of the brackets offers an astonishing degree of resistance to sliding of the teeth, possibly because of small bends put into the wire inadvertently by stresses of occlusion. The round occlusal wire is, therefore, dispensed with as quickly as practicable. In fact, it is used in the first place only to eliminate the shock that might follow if a flat wire were placed without any preliminary preparation of the teeth in their vertical positions, it being obvious that even slight discrepancies of position in the vertical plane are susceptible of far gentler correction by means of a round wire than by means of a flat one.

After using the pin-and-tube appliance for a limited time, and the ribbon-arch appliance and the edgewise appliance rather extensively, my judgment with respect to this new universal technique is to the effect that its potentialities for precise and accurate results are distinctly greater than those of any of the other three mentioned, and that even with these greater potentialities the dangers inherent in any appliance in unpracticed hands are, in the case of this one, relatively slight, perhaps even less than in the case of the Mershon lingual arch wire. Moreover, the resources inherent in the appliance exceed those of any of the other three in somewhat the same way as the number of combinations possible with three figures exceeds those possible with two. In the forward progress of technique, undoubtedly this appliance marks one of the biggest steps taken for a long time.

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ROENTGENOGRAPHIC FINDINGS OF EDENTULOUS AREAS*

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WASHINGTON, D. C.

IN REVIEWING the available literature no evidence of statistical data on studies of edentulous areas can be found where the radiograms have been taken as routine mouth examinations.

Sweet,[1] in his article, "The Edentulous Mouth and Focal Infection," quotes reports of Logan and Molt. In this report Logan listed thirty-five cases with eight residual roots and five periapical lesions, but it was not deemed a sufficient number of cases to investigate further. Molt reported 900 areas with 48 per cent residual roots or retained infection, but his results were obtained because of "previous roentgenograms or determinable history which indicated past pathological involvement."[2] Gardner[3] found about 33 per cent of 10,000 patients examined in one year showed residual roots, in areas of previously extracted teeth.

PURPOSE

The purpose of this work was to determine the frequency of occurrence of pathologic conditions in edentulous areas of naval personnel. No attempt was made to classify such pathologic conditions as were found.

PROCEDURE

One thousand and seventy-five roentgenograms of edentulous areas were taken from the files of the Naval Dental School. An edentulous area was so considered wherever a tooth was missing. This does not include areas showing recently extracted teeth but rather healed calcified areas. Mouths showing complete absence of teeth were not considered.

RESULTS

1. 94.05 per cent of the areas studied showed no pathosis.
2. The areas showing pathosis comprised 5.949 per cent of the cases studied.

CONCLUSION

From these results it appears that a comparatively low pathosis index for edentulous areas has been observed at the Naval Dental School, although further studies will have to be made in order to arrive at a more definite comparative evaluation.

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‡Lieutenant (Junior Grade) Dental Corps, U. S. Navy, obtained data.

PIONEERS IN ORTHODONTICS

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IN PRESENTING this short sketch, it will be my aim to draw your attention to those outstanding pioneer members of the dental profession whose broad understanding of their obligation to their patients made them, even at that early date, endeavor to correct the functional and esthetic aspects of the organs which were under their care, as well as to make necessary repairs and replacements. Among these, as is shown by their writings, many even approach the modern biologic concept which today is held by all advanced members of the dental profession in regard to their work and to the relationship which exists between the teeth and the rest of the body. I do not mean to say that only those men who became interested in what we now call orthodontics held or acquired this broad outlook regarding their profession, because such is not the case. In what is now known as the specialties of prosthodontics, periodontics, and others, there have been men who wrote intelligently and well a century ago and so far as fundamental principles go, much of what they said then could be followed today with good results, but I have to do here only with those men who became interested in trying to correct malocclusions which marred either the function of the masticatory apparatus or the appearance of their patients.

Among these perhaps Fauchard stands out as the high light at the head of that long sequence of investigators who undertook to prevent, and if they could not do that, correct, malocclusions of the teeth and malrelations of the dental arches to each other and to the rest of the face. It is quite probable that others before Fauchard attempted to correct the malalignment of the teeth in some of their patients, but according to Angle, Fauchard presents the forerunner of what has long been known as the expansion arch and practically in the same form as used today. He recognized what we all know today, that crowded and overlapped teeth were merely a symptom of lack of development in the dental arches and as a logical treatment he endeavored to expand those arches until they would accommodate the thirty-two teeth which had been designed for them by nature. Angle further says in his seventh edition of *Malocclusions of the Teeth,* "Unquestionably the conception of this device, which in its greatly improved form we rely on so largely in modern practice, was the one greatest step in the invention of appliances."

J. M. A. Schange, another Frenchman, also contributed to orthodontic literature and appliances by designing and reporting in 1841 a band for the attachment of an appliance to a tooth. The band he designed was a clamp band and relied for its security upon the tooth to the turning up of the screw or bolt with which it was provided, much as we do today. It would seem that Schange

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antedated both Dwinelle of New York and Gaines of England, who have been credited with introducing the screw in the construction of regulating appliances. The plain band has been mentioned as early as 1726; that is, bands without bolts which were placed around the teeth, though just how they were to be held in place does not seem clear since they were not reported as having been cemented upon the teeth. Dr. Angle very truly says that the real value of the orthodontic band was achieved through its attachment to the tooth crown by means of cement, which was accomplished in about 1872 by Dr. McGill, of Erie, Pa. In going over the early history of orthodontics it will be found that the advances which were made were mostly in the nature of appliances and the names of many men are associated with some appliance because they were the first to use them. Back in 1848 Dr. Dwinelle of New York invented the jack-screw, or I should more properly say adapted it for use in the mouth. It was one of the first appliances manufactured and kept in stock by the supply houses. Dr. Dwinelle also made important contributions to the literature of the day.

Dr. Angle credits Dr. E. A. Tucker, of Boston, with the introduction in 1846 of rubber for tooth movement. Occipital anchorage gained through the use of the headgear for the reduction of the mandible, as well as protruding anterior teeth, was introduced by Dr. Norman W. Kingsley of New York in 1866. There seems to have been no branch of dental science to which some contribution was not made by Dr. Kingsley. It was he who designed and used a form of bite plane with which he treated patients who had a distoclusion of the mandible or a mesial protrusion of the maxillary arch in relation to the opposing arch. Dr. Kingsley called this treatment jumping the bite, and though cases treated in that way often relapse, it is nevertheless still used a great deal in conjunction with other treatment. About the same time, or possibly a little later, Mr. Walter Coffin of England introduced piano wire for use in orthodontic appliances, which shows that men all over the world who were engaged in the practice of dentistry were giving some of their attention to the correction of those malformations which so often were treated only with the forceps.

It was, however, during the 80's that the first great advance in orthodontic art and especially in orthodontic science took place. Those men who were most closely allied with this movement and who exerted the most profound influence upon orthodontics, as we know it today, were Dr. E. A. Bogue of New York and Paris, Dr. Isaac Davenport, who was associated with Bogue in Paris, Dr. Henry A. Baker of Boston, Dr. J. N. Farrar of New York, Dr. Calvin S. Case of Chicago, Dr. George C. Ainsworth of Boston, Dr. William Earnest Walker of New Orleans, Dr. Victor Hugo Jackson of New York, Dr. S. C. Guilford of Philadelphia, and others. But the one who devoted himself most exclusively and gave most abundantly of his talent and capacity to work was Dr. Edward H. Angle, and unquestionably the development of orthodontics as a specialty of dentistry was almost entirely due to him, although I believe Dr. Calvin Case devoted himself exclusively to the practice of orthodontics as a specialty almost as early as did Dr. Angle.

It was my good fortune as a youngster to meet nearly all of the men referred to as having been responsible for the orthodontic renaissance of the 80's, and if I may be permitted I will speak of them in a rather personal way.

Through a mutual friend, who was also a patient of Dr. Bogue's, I secured a position with him between my junior and senior years at college. The school year was short and the vacation was long in those days, so that I was with him about seven or eight months and I enjoyed it thoroughly, gradually being permitted to take a hand in nearly everything that went on in the laboratory or the office. What interested me most, however, was the orthodontic patients and I think this was because Dr. Bogue himself took more interest in that part of his work than any other. The greatest part of his writings, even at that time, were devoted to orthodontic subjects and without doubt his preceptorship was more responsible than anything else for my lifelong interest in orthodontics. I take pleasure here in acknowledging my great debt to him and to Dr. Angle in whose school I was some years later accepted as a student.

Dr. Bogue's writings were quite voluminous, and though they covered the early field of orthodontics quite thoroughly, they were directed more particularly to two phases of it. The first was the importance of the first permanent molar, upon which subject he wrote several papers, notably "The Principal Molar in Man, and Its Relation to and Bearing on the Other Teeth," which he read in Baltimore before a meeting of the Maryland State Dental Association, and probably elsewhere, in about 1901. (I know it was during the presidency of Dr. Harry Wilson.) The other point which Dr. Bogue stressed in his writings particularly was the necessity for expansion of the temporary dental arch when it was evident that it was not making the lateral growth necessary to contain the permanent teeth in good alignment. This is a subject about which there is still considerable argument, and it is not my purpose to try to settle it here.

While I was with Dr. Bogue there was an important meeting of the Odontological Society of New York at which Dr. Calvin S. Case read a paper entitled "Facial Orthopedics" in which he advocated changing the name of our specialty from orthodontia to facial orthopedics. Personally, this has always seemed to me a perfectly logical thing to do as the name is really more descriptive than the one we continue to use. Dr. Case contributed voluminously to the literature and eventually wrote a book entitled *Facial Orthopedics,* in which he covers practically the whole field from etiology to treatment and retention. There is no doubt but that he has been one of the most valuable contributors to the knowledge we have of our specialty. Dr. Bogue had Dr. Case with him to dinner that night at his house and he also asked me, and I remember I was greatly impressed by the distinguished company in which I found myself.

Dr. J. Nutting Farrar actually antedated Dr. Case and Dr. Bogue a little, I believe, in his writings, but I did not have the good fortune to meet him until seven or eight years later. He was also a very voluminous writer, and I suppose that no other man has ever had as great a collection of appliances, including his own and others which were sent to him, as did Dr. Farrar. It was his custom when he read an article in a journal describing the treatment of a case and the appliances used by the author to write him and ask for the appliance to be photographed and illustrated in his book. A great many of them complied, and he was very punctilious about giving credit to the author and returning it to him when requested. In his book, *Irregularities of the Teeth,* he has illustrated

almost every appliance which was ever used up to the time of its publication. He had in his possession five or six large mason jars which were filled with appliances made of the various gold alloys which he had employed in his practice and which he never melted down or used over again. My visit to him was for the purpose of securing these appliances for the orthodontic exhibit which we were making at the Jamestown Dental Congress held during the Jamestown Exposition. He treated me most courteously, kept me with him half a day showing me his cases as they came in, and insisted upon my having lunch with him, but he told me he was afraid to let these appliances out on exhibit because much of the next two volumes which he intended to write depended on them. He had done a good deal of work on these two volumes, but as he was then probably 70 years of age, or older, only one of them was completed and published. My impression at that time was that he was practicing orthodontics as a specialty and had done so for a long time. He was always greatly interested in the old Baltimore College of Dental Surgery, of which I believe he was a graduate and each year he gave a copy of his first volume of *Irregularities of the Teeth* as a prize for the best essay on orthodontics. My winning it in my graduating year was my best credential when I called on him, but not enough to induce him to loan us his treasured appliances. Before continuing I would like to say that it will pay any orthodontist of today to read Dr. Farrar's writings on the subject of intermittent force. Through clinical observation he established the fact that teeth could be moved by means of intermittent force supplied through the medium of the screw $\frac{1}{120}$ of an inch a day without inducing any soreness. He treated this subject in an exhaustive and able manner and some of the most modern research of today tends to verify his deductions.

Dr. Henry A. Baker of Boston is the next one to whom I would like to call your attention. He was for many years a well-known practitioner, but during the latter part of his career he gave more and more of his attention to orthodontics. He is perhaps best known today, and will be known in orthodontic history, for his introduction into orthodontic practice of the principle of intermaxillary reciprocal force for correcting the relationship of the entire dental arches to each other through the use of elastic rubber bands. (Angle had already used intermaxillary elastics to move individual teeth.) Dr. Baker first tried this on one of his own sons and the results were so successful that it attracted the attention of others throughout the country, particularly Dr. Angle. It provided a means of avoiding the extraction of teeth in many instances that had previously been unavoidable. As a matter of fact, many men adopted the theory that it was inexcusable to extract any tooth under any circumstances. It was natural that this new adaptation of force which has really done so much to revolutionize orthodontic practice should be overworked by many men, and there were, of course, many failures where it was used inadvisedly. However, there has probably never been any principle introduced into orthodontic practice which so revolutionized it as did the use of intermaxillary elastics by Baker in conjunction with the expansion arch. After retiring from practice at quite an advanced age, Dr. Baker continued to receive messages of congratulation from important orthodontic societies felicitating him upon his accomplishments and expressing the esteem and affection which so many men had for him.

Dr. Ainsworth is another man who deserves mention as a pioneer in orthodontics. It was he, I believe, who first used vertical tubes instead of horizontal ones for the attachment of labial arches to the anchor teeth, a principle which has been so universally adopted in recent years since being introduced by Dr. John V. Mershon as an attachment for the removable lingual arch.

Dr. Walker of New Orleans was in his day one of the most successful practitioners of orthodontics and made valuable contributions both to the literature and to the technique. He was especially noted for the beautiful and unique removable appliances which he used and which are, to this day, used by some of our well-known specialists.

Dr. Guilford of Philadelphia was another outstanding figure in the orthodontic world up to the time of his death. He was the author of a book on orthodontics which was used as a textbook in a number of colleges, and he was a most earnest and successful practitioner, always glad and willing, as were most of the older men, to impart whatever he knew to fellow practitioners.

Dr. Victor Hugo Jackson of New York deserves mention in any list of pioneers of orthodontics. His outlook upon the subject was rather narrow, and he always limited himself to appliances of his own design, chiefly removable ones, yet his persistence was such and his honesty of purpose so evident that he contributed a great deal to the general advancement of orthodontics. He was the author of many articles, gave innumerable clinics, and published a book covering his methods of treatment, which was accepted by many members of the profession as being the last word in orthodontics. It appealed, however, more to the general practitioner than to the specialist as Dr. Jackson did not seem to have the faculty of adopting valuable contributions to methods and technique other than his own. I very well remember the night in New York, previously referred to, when Dr. Case gave his paper on "Facial Orthopedics," in which he illustrated many beautiful facial casts in plaster, a procedure he employed at that time almost universally as a record of his cases. Dr. Jackson in discussing it told of a method he himself had devised for making a record of facial characteristics which consisted in adapting soft lead wire to the patient's profile, then laying it on paper or cardboard and outlining it. Neither seemed to think very highly of the other's method, and as a matter of fact both went into the discard, as the photographic method gained favor, only to be revived every few years by men who doubtless often think they are introducing something original.

The next and last figure of whom I wish to speak is Dr. Edward H. Angle, one of the greatest geniuses that the dental profession has ever produced and without doubt the greatest contributor to, if he was not actually the originator of, the specialty of orthodontics. Dr. Angle appeared in the field at a time when a number of men in this country and abroad were devoting enough time to this branch of dentistry to justify considerable space being given to it in the various dental journals which were then published. There was really a good deal of orthodontics being done but almost every man was using appliances either designed by himself or designed from a combination of his own and others' ideas, and with the exception of certain outstanding men the art and science of orthodontics were regarded as being covered almost entirely by the construction and manipulation of appliances. The report of a case usually constituted

a description of the appliances used together with an illustration of results obtained. Practically speaking, there was no classification of malocclusions, and strange as it may seem, men who were devoting a great deal of their time to orthodontics nevertheless were not aware that malocclusions did fall into three general classes with various subdivisions. Therefore, every case was a law unto itself and was treated as such and new appliances or machines, as they were often called at that time, were usually invented to treat the case. So far as I know Dr. Angle was the first to make a comprehensive study of malocclusion with a view to discovering if there were certain similarities or types which might be classified and also with the purpose of determining, if possible, their etiology. After a great deal of study he found that malocclusions could be classified, that they fell naturally into three general classes, the key to which was to be found in the mesiodistal relation of the maxillary and mandibular buccal teeth to each other. He seems to have been the first one to recognize that there was a normal occlusion, a certain definite relationship between the molars and premolars of the upper and lower arches, and that this relationship never varied in cases where no malocclusion was evident. He observed, however, that the anteroposterior relation of the posterior teeth might be normal, but that there might at the same time be malocclusion, that is, crowding and overlapping of the anterior teeth or even buccolingual malrelation of the buccal teeth. All such cases he put in Class I. All cases in which he found the upper dental arch too far forward or the lower too far back in relation to its opposing arch, he put in Class II, and the reverse of this condition Class III. Two divisions each with a subdivision in Class II and one division in Class III he found would cover practically all malocclusions which came under his observation. Of course, all of these classes may present minor differences, but these may be easily described in conjunction with the main malocclusion. The Angle classification was adopted and is in use all over the world in spite of the fact that several other classifications, or at least ingenious and scientific modifications, have been devised which have merit, but are far more complex. It will be a long time before any other classification completely supersedes the one discovered by Dr. Angle. I like to say *discovered* because this classification always existed, only it had not been observed up to his time. Its adoption by the profession constituted one of the earliest and most important contributions to our nomenclature which is still lamentably confusing but which, I am glad to say, is receiving intelligent consideration by committees of the American Association of Orthodontists and the American Board of Orthodontics.

It also became apparent to Dr. Angle, after finding that malocclusions could be classified, that the appliances used for treating them might also be greatly simplified and to a great extent systematized. This he did very successfully and although he claimed no originality for most of the appliances he used, yet they came to be called the Angle appliances and the Angle system was spoken of. Later on, Dr. Angle developed many original modifications of the first appliances he used and he never really discontinued his efforts to improve them until the time of his death. Having classified malocclusions and systematized the instruments or appliances which were used in treatment, Dr. Angle felt that the time had come when one might specialize in orthodontics with some degree of satisfac-

tion. He accordingly did so with great success and then inaugurated his third great undertaking which was to have such a profound influence in establishing the specialty of orthodontics and advancing our knowledge of both the art and science underlying it.

This third undertaking was the establishing of the "Angle School of Orthodontia." For several years the school was held in St. Louis, in which city Dr. Angle had been practicing many years. About 1908, he felt that he wanted to give up practice and devote himself to teaching and decided to move the school east, the first course after this change being held in New York, which was the one I was permitted to attend and was the occasion on which I first met this remarkable man. Not one of the men who assembled that first morning will forget the feeling he had as he was put through the paces to see if he had acquired the preliminary information which Dr. Angle regarded as requisite to a proper understanding of his teaching. We had been plugging away for dear life for some time previously getting ready for this occasion, and I do not think any of us were very hopeful, although as a matter of fact we were all, I believe, finally accepted and most, if not all, eventually received certificates. At the outset we were informed in no uncertain manner that if we thought we knew anything about orthodontics we were probably wrong and we would be expected to start at the beginning and acquire in two months what was then known of technique with more theory thrown in than we ever had to get in a whole year in college in those days. We just about survived the two months grilling and that was all. What we *in*gested during those two months we were several years in *di*gesting, but I think all of us felt the experience was well worth it. Nearly all of the students accepted by Dr. Angle were required to promise that they would give up general practice within six months to a year, and the majority of them did so. These men formed the nucleus of the present body of orthodontic specialists. Like all men of genius, Dr. Angle had his faults and made his mistakes, but he was more often right than wrong and he was deadly in earnest, really believing, I think, that he had a mission in life, the fulfillment of which he pursued with that ungrudging and relentless tenacity that was characteristic of him and which got results. He has been criticized and his theories, at least some of them, have been attacked, but when the history of the development of orthodontics has been finally written, his will be the most lustrous page.

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A CONSIDERATION OF ETIOLOGY

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THE title, "A Consideration of Etiology," implies a philosophic approach rather than a recitation of factual material relative to cause and result. Therefore, no attempt will be made to consider local mechanical causes, and we will proceed from a basic standpoint even though this may necessitate the inclusion of material that might appear quite elementary.

It seems necessary first to define etiology as applied to orthodontics. The usual definition of etiology is "the science of causes," and while this interpretation is a true one the ever-increasing knowledge in the biologic sciences makes it more and more difficult to assign a specific cause to a specific result. As Bergson states in *Creative Evolution,* "The laws that govern unorganized matter are expressible, in principle, by differential equations in which time (in the sense in which the mathematician takes this word) would play the role of independent variable. Is it so with the laws of life? Yes, if it is agreed a *priori* to liken the living body to other bodies, and to identify it, for the sake of the argument, with the artificial systems on which the chemist, physicist, and astronomer operate. But in astronomy, physics, and chemistry the proposition has a perfectly definite meaning: it signifies that certain aspects of the present, important for science, are calculable as functions of the immediate past. Nothing of the sort in the domain of life. Here calculation touches, at most, certain phenomena of organic *destruction.* Organic *creation,* on the contrary, the evolutionary phenomena which constitute life, we cannot in any way subject to a mathematical treatment. It will be said that this impotence is due only to our ignorance. But it may equally well express the fact that the present moment of a living body does not find its explanation in the moment immediately before, that *all* the past of the organism must be added to that moment, its heredity—in fact, the whole of a very long history." This more completely states our problem than does the simple definition, "the science of causes."[1]

It is evident in assigning causes that we must take into consideration certain underlying factors which condition the effect of mechanical causes. Therefore, an attempt will be made in this paper to outline the factors which must be considered in the evaluation of etiologic material.

Because of the complexity of causal relation the problem of compiling a fund of etiologic knowledge is difficult but the consequences of a better understanding of the factors which condition malocclusion are of tremendous socio-economic importance.

The incidence of malocclusion computed from various sources, admitting that interpretation of malocclusion by various investigators might make the figure questionable, would indicate that 20 per cent of school children need orthodontic service. This means eight to nine million children in the United States.

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The present method in which a large majority of the cases referred to the orthodontist are well-developed malocclusions is unsound; it reduces the possibility of successful treatment and places an unwarranted financial burden on the shoulders of the parent.

If orthodontic service is to be extended to a large group it must be done, not through perfection of mechanics, or standardization of procedure, but rather through a better appreciation of the factors which condition malocclusion: an ability to recognize deviation from the typical at an early age, and better knowledge of the limitations of orthodontic therapy.

One of the primary considerations is to establish a common criteria of normality and an appreciation of the part played by variation. "No one supposes," says Darwin, "that all the individuals of the same species are cast in the same mold." That "individuals" are in truth individual is a central fact of biology; irregularity in the arrangement of the teeth may, therefore, be considered to constitute primarily one of the many problems of variation. But the term "variation" implies a standard, whether it be a loose approximation to an ideal or the more precise mode, or mean or median of the biometrician, to which they may be referred, or at least some general conception of the structure in question, independent of individual differences, and by reference to which these differences may be appreciated and their extent assessed. Such a standard or general conception is often spoken of for convenience, as the "normal."[2]

Unfortunately, the term "normal" has a wide range of interpretation in the minds of members of the profession. The factors which are necessary for an interpretation of the term "normal occlusion" in its practical application to the individual are: the law of occlusion; the hypothetical standard based upon this law of occlusion; the structural design of tooth forms and supporting structures; the significance of variation; typical occlusion; the relation of type to the individual; the standard of function within physiologic limits.

In the light of these factors "normal occlusion means that there exists a relation of the teeth in function that will help to establish and maintain in its most stable form the organization of the individual organism. It does not necessarily mean perfection in the surface relations of the teeth."[3] It includes many cases that border on the typical but do not come within the range of type. Adaptation may frequently bring about functional normality even when the component parts and relation of the dentures are not typical.

Now we come to a consideration of the general problems of evolution, variation and heredity in growth of the jaws and teeth. A complete elaboration of the effect of evolutionary tendencies, sufficient to point out that evolutionary reduction of the human jaws is going on, would require an entire paper. However, as Johnson states, "Natural disharmonies in size, form, number and relation of teeth may be expected."[4]

That there exist racial differences in the facial skeleton is a recognized fact; its significance probably cannot be accurately estimated but the hypothesis has been advanced that racial intermixture, particularly in the United States, has an important bearing on the incidence of malocclusion.

In many fairly recent textbooks the subject of heredity as a factor in malocclusion is dismissed with a casual reference. However, J. C. Brash, in his

series of lectures on *The Etiology of Irregularity and Malocclusion of the Teeth*, says, "I do not conceal my own opinion that this is probably the most important single aspect of the whole subject."[5] A. LeRoy Johnson, in summing up a report on his work in collaboration with C. R. Stockard, at the Cornell Experimental Morphology Farm, states, "From the evidence now available there is no reason to believe that all conditions of irregularity and malocclusion are primarily of genetic origin. Nevertheless, to ignore the hereditary factor is to close our eyes to a vital phase of the phenomena of all development."[6]

A promising field of inquiry into the inheritance of occlusal conditions is the study of the occlusion of identical twins. The similarity evidenced in the occlusal relations and arch forms of identical twins, as compared with the dissimilarity of those in fraternal twins or siblings, demonstrates the truth of Galton's words, "There is no escape from the conclusion that nature prevails enormously over nurture when the differences of nurture do not exceed what is commonly to be found among persons of the same rank of society and in the same country."[7]

The difficulties of securing evidence of the influence of genetic factors in humans over several generations has brought about a study of relations in contemporary generations. The method is discussed by Cotterman in the September, 1941, issue of *Scientific Monthly*[8] and offers a possible field of investigation from an orthodontic standpoint. The evidence is worked out on a statistical basis, the relationship of the individuals under observation being reduced to working equations.

Study of the occlusion of identical or uniovular twins, in addition to providing the strongest argument as to the inheritance of the general form of the jaws and teeth, may through the assessment of differences provide valuable information to determine the exact influence of environment on the genetic background.

Before proceeding to a consideration of some of the environmental factors in the growth of the jaws, it might be well to review briefly the regional development of the face.

The failure of union of the embryonic processes and the resulting malformations in their gross form are too familiar to require elaboration. Their cause is not well established, but whether due to chemical or other factors, they suggest that a minor growth failure may be important in some of the relatively small deviations from typical, especially in the maxilla, because of its origin from several centers; premaxillary micrognathia may be taken as an example.

It has been suggested by Brash that a classification of jaw malformations in the field of teratology, to the minor developmental aberrations represented by irregularity of the teeth, might be a basis for further study of the part played by these embryologic deviations.[9] There are many abnormalities which have the appearance of embryologic holdovers; increased knowledge of their significance would be valuable.

GROWTH AND DEVELOPMENT

Growth is defined as the increase in any part of the body by addition to the number of its cellular elements, without differentiation into unlike tissues. Differentiation is defined as: changing from general to special characters, a

specialization. Development is defined as the processes through which the organism goes from lower to higher organization. Tyler[10] divides growth into three stages:

The first, the stage of pure growth, influenced largely by inherent growth potentialities;

Second stage consists of growth and function; growth is still of prime importance, but exercise is essential—it must be of proper amount and kind;

Third stage, function; finishing touches in response to function.

These stages are not clearly defined, blending into each other imperceptibly, and different organs are in different stages at the same time.

Johnson says, "Fortunately for us in the consideration of developmental conditions of the dental apparatus there are structural manifestations that indicate, to a certain extent at least, the different stages of development referred to by Tyler.

"There can be little doubt that the time when the deciduous teeth are in occlusion is the time when exercise is essential. Growth is still in progress, but, as in the second stage of development designated by Tyler, exercise of the proper kind and amount is necessary to healthy growth . . . until the adult denture is complete, the growth impulse in order to attain its fullest realization becomes more and more dependent upon exercise."[11]

The relative importance of pure growth versus growth and function is not clear but the degree of development of the arches in congenital absence of teeth suggests that growth is the more important.

Insofar as the part played by the teeth in influencing the size and form of the jaws is concerned, "it may be stated with assurance that there is no direct causal relation. No doubt teeth and jaws are correlated, but the simple proposition that the presence of teeth provides a quantitative mechanical stimulus for the development and growth of the jaws is negatived by the facts of comparative dental anatomy, and by such evidence as the crowding in the jaws of dwarfs and the spacing of normal sized teeth in the jaws of giants."[12]

We see many cases of lateral incisors erupting in the position occupied in their crypts, of canines still maintaining their positions outside the arch which they occupied in their crypts. These cannot be explained from a purely mechanical standpoint.

PHYSIOLOGY OF TISSUES

An important part of our background for a proper evaluation of dental abnormalities is a knowledge of the physiology of oral structures.

Bone is the most highly specialized of the connective tissue group of structures. From the standpoint of physiology, bone is secondary to muscle because the latter is physiologically dominant in adaptation.

The theory of bone formation upon which orthodontic methods have been based is Wolff's law. This has been questioned by several investigators, more particularly Mark Jansen, sufficiently to say that there is undoubtedly a correlation between the function and internal architecture of bone. Bardeen states that "The form of the individual bone depends partly upon heredity and partly upon the mechanical and chemical influences to which it is subject during growth."[13]

Such a concept of the development of bone is very different from that expressed in the orthodontic creed which says, "Bone grows as a result of mechanical stimuli." That bone growth can be brought about by stimulation of an orthodontic appliance is unfortunately still believed by many; that the form of alveolar bone may be modified or that the removal of mechanical inhibitions may release dormant potentialities of bone growth is admitted, but that bone is grown through mechanical stimulation beyond the developmental possibilities of the germ plasma is untenable.

Physiologically muscle is a part of the nervous mechanism. The motor nerve and the muscle are functionally interdependent. When we use the term "muscular action," we are not referring to a single action of muscular contraction, but to a double physiologic action, namely, contraction and shortening of the muscle producing the desired effect . . . and relaxation and elongation of its opponent—contraction and relaxation of muscle are two opposite physiologic states.[14]

Embryologically the muscles of mastication arise as a single muscle mass. During the second month this mass is differentiated into several parts. This origin from a common mass, the common innervation, plus the physiologic action of muscle impresses us with the significance of the functional interdependence of muscle groups. Individual muscles cannot act alone. Study of the facial musculature should convince one of the difficulties of interpreting perversions of muscle function by assigning the fault to an individual muscle.

In the use of myofunctional exercises it must be borne in mind that these must comply with sound orthopedic principles and where an attempt is made to strengthen one group of muscles an external agent must be introduced to relieve the tension of the opposing group, otherwise both groups of muscles are exercised equally.

The vascular structures are developed largely through functional adaptation—the basic pattern is determined, but the size, direction, and particular structure are adapted to the functional demands. "Thus, from a consideration of the physiology of oral structures it is evident that the masticatory apparatus is made up of parts quite different in character. The teeth are purely nonfunctional inherited structures. Bone, vascular, muscular and nervous tissues are both functional and nonfunctional, i.e., they show functional development of rudimentary structures; and the alveolar process is as purely a functional structure as the teeth are nonfunctional."

The growth of the several tissues is influenced by different sets of factors. That they develop from different blastodermic layers is an important consideration in the matter of reaction to various stimuli. Under normal conditions these differences in growth phenomena are harmonized by the integrative agencies of the organism as a whole and the activities of the part. When these harmonizing agents fail, disharmony and atypical development usually result.

The significant phase of evaluation of the physiologic condition of the oral structures in a specific malocclusion is to determine whether correction can be brought about by modification of the functional structures through various agencies at our command to the requirements of the nonfunctional tooth struc-

ture, or whether tooth substance must be modified to conform to the limits of the supporting structures determined by the product of the genetic pattern plus environmental factors.[15]

GENERAL OR CONSTITUTIONAL FACTORS

Most orthodontic texts list the common diseases of childhood as probable factors in malocclusion but do not present any evidence of their exact influence. Any disturbance of the metabolism of the organism would be reflected in the development of structures being formed at that time; for example, the effect of the exanthemas upon the epithelial structure (enamel) is well known. However, the relatively short duration of the usual childhood disease should not in itself disturb normal growth processes to a marked degree; more knowledge of this influence is necessary before classing the common diseases of childhood as a major factor in malocclusion.

Rickets has been considered a factor in malocclusion, the assumption being that muscular stresses acting upon the impaired bone causes malformations. Brash says, "It is highly probable that any tendency to believe that rickets may be responsible for deformities of the jaws is due to the idea that such deformities might be produced by a bending of the jaws, on the analogy of the deformities of the limb bones; but deformities of the limb bones are due, not so much to muscular action, but largely to the effect of weight of the body upon the disordered epiphyseal growth areas."[16]

Hatfield examined four or five hundred cases of rickets "and came to the general conclusion that the arches on the whole were very well developed and he could find no characteristic that was not to be found in the mouth of children not suffering from rickets."[17]

One of the important influences in growth is the ductless glands, and there has been much speculation as to their influence on the development of the facial skeleton and indirectly on the positions of the teeth.

The retarding influence of thyroid deficiency, the stimulating effect of the thymus until puberty, the retarding of growth in the epiphyseal ends of the long bones and perhaps in the facial skeleton by the sex glands, the effect of the pituitary on skeletal growth, of the parathyroids to calcium metabolism, are influences of interest to a study of facial development. That there is a balance of these glands, under normal conditions, is established, but what the exact significance of endocrine imbalance is as it relates to malocclusion is not clear. With the present state of our knowledge it seems best to limit speculation of endocrine influence to those cases where the general condition of the patient can be definitely attributed to hormone disturbance.

Prenatal influences have been accentuated in recent years and undoubtedly the nutrition and general well-being of the pregnant mother is of utmost importance. However, it should be borne in mind that the fetus is a parasite and gestation a sacrifice of the individual for the species; apart from disease resulting in some form of impurity of the blood or damage to the placenta, the evidence points to the child receiving the essentials of growth in spite of nutritional deficiencies of the mother. Care should be exercised in ascribing developmental defects of the child to prenatal dietary deficiencies.

LOCAL CAUSES

Habit: "The phenomenon of habit is a normal manifestation of living tissue, essential to the development and functional activities of the organism."[18] Habit movements are determined by:

1. Inherited instinctive tendencies.
2. Result of action.
3. Nature and order of stimulation.

In orthodontic literature reference is made only to pernicious habits: finger-sucking, thumb-sucking, lip-biting, and abnormal tongue pressure and movements. Little attention is paid to the factors that may have initiated these habit movements, and there is every reason to believe that the underlying determinants of the habit may be of far more significance than the habit movement itself. There is evidence that pernicious habits that are ordinarily considered to produce atypical conditions may have no effect on the structural form. This would indicate that there are underlying factors which condition the influence of habit movements.

The relation of form upon the initiation and continuation of habit, particularly with lip and tongue habits, is not sufficiently stressed.

Johnson says, "The most effective means at hand to eliminate habits that are instrumental in the formation of abnormalities is to eliminate the stimuli which initiate the primary movements. This we can do by maintaining the teeth and surrounding parts in as nearly their typical forms and relations as possible."[19]

Mouth breathing has long been held as a cause of malocclusion. Brash, after reviewing the various mechanical theories relating to abnormal muscle pressure in mouth-breathers, quotes Mr. T. B. Layton, "We must be content with saying that mouth breathing is not necessarily followed by a contracted arch. If, therefore, mouth breathing is sometimes a cause of contracted arch, there must be some other cause at work as well."[20]

Howard[21] reported that of 159 mouth-breathers examined, ninety-four (59.1 per cent) had normal jaws and occlusion and only twenty-two cases had Class II Division 1 deformity.

The establishment of normal breathing is to be desired, but to place mouth breathing in the category of a primary cause of malocclusion seems hazardous in the light of present evidence.

The labial frenum may be considered a local factor although its location and extent may be determined genetically. The significance of the frenum as an etiologic factor in spacing of the central incisors has been a subject of considerable discussion. While present orthodontic thought is still divided on the question, the preponderance of evidence is that it rarely is of sufficient importance to merit surgical interference.

Ectopic eruption of the first permanent molars, in which they force out the second temporary molars, is a manifestation of the growth problem and undoubtedly indicates a lack of growth in this area and requires a different approach than a simple mesial drift due to reduction of mesiodistal space.

A statement of the problem, its significance and an outline of the basic principles which should be considered in dealing with it, naturally suggests a

question as to method. It is apparent that one of the greatest needs is a workable plan of statistical observation of normal and abnormal growth, with an agency which would act as a clearing house for the evaluation of this material. It would undoubtedly be impractical and probably undesirable to place the responsibility for such a compilation upon the shoulders of any one individual, but it should be the responsibility of some organized group such as an orthodontic society to provide means for collecting a fund of etiologic knowledge backed by scientific evidence.

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A SURVEY ON THE USE OF THE GUIDE PLANE

P. J. THOMAS, SAVANNAH, GA.

IN 1934 Dr. Winston P. Caine, of Chattanooga, Tenn., presented before this organization a report on the removal of the abnormal labium frenum. The interesting differences in opinions expressed at that time prompted this survey.

The original plan was to ask for opinions as to the mechanical cause of "open-bite" during treatment and its prevention. From this, the plan was enlarged to include the treatment of the other extreme condition, close-bite, especially in connection with the appliance generally known as the guide plane.

During an after-session discussion at a previous meeting of this organization one of our most active members made this statement, "I have read some essays as many as three or four times, then wondered if I understood them as the authors intended." With this statement in mind and the fact that in a few instances correspondence was necessary in order to clear up certain points I feel that in the hands of one more experienced this survey would prove more valuable.

Dr. Russell E. Irish, of Pittsburgh, Pa., refers to the book *Labio-Lingual Technic*, of which he is a coauthor with Dr. O. A. Oliver and Dr. Claude A. Wood. Rather than misinterpret his ideas, his name is placed with that of Dr. Oliver because of their mutual opinions.

Question One

In what classes or types of conditions is the guide plane contraindicated?

This question was not intended to cover abnormal posterior or anterior relations. But, as no explanation was given with the questions, these conditions were included by some of those participating.

The answers are:

DR. CHARLES R. BAKER, EVANSTON, ILL.—If a "guide plane" means an appliance on the maxillary teeth arranged so that the mandibular anterior teeth occlude with a metal grillwork, my opinion is that such a device is seldom if ever desirable. If the appliance is made of vulcanite (or similar substance) and arranged to deflect the mandibular teeth to the labial without influencing the posterior teeth, I will say that I have used such an appliance with satisfactory results.

DR. WILLIAM E. FLESHER, OKLAHOMA CITY, OKLA.—I consider there are too many conditions in which the guide plane is contraindicated to enumerate them. I prefer to state wherein I use them.

DR. STEPHEN C. HOPKINS, WASHINGTON, D. C.—1. Open-bite cases. 2. A typical Class II condition in which the upper teeth are forward in their relation to the head.

Read before the Southern Society of Orthodontists, September, 1941, Raleigh, N. C.

DR. ANDREW F. JACKSON, PHILADELPHIA, PA.—In all cases in which there is the slightest indication or tendency toward open-bite. Its use should be immediately discontinued the moment these symptoms appear.

DR. OREN A. OLIVER, NASHVILLE, TENN., AND DR. RUSSELL E. IRISH, PITTSBURGH, PA. —First I feel the specialty needs to agree not only on nomenclature but also on what is actually meant and understood by "a guide plane." I see in both clinics, literature, and discussions that guide planes may be manufactured by commercial manufacturers, made out of alloy, inserted on prosthetic appliances, etc. To me, none of these is correct, truly made, or indicated in many instances where actually used. Most of the answers to this and the other questions are well contained and specifically dealt with in our book, *Labio-Lingual Technic*, by Oliver, Irish, Wood. On pages 286-317, and again on pages 318-341, I believe you will find suitable and scientific answers to most of the questions you asked. The occlusal guide plane is not indicated in any of the cases not mentioned under "General Uses" except it be for a portion of treatment time only.

DR. H. C. POLLOCK, ST. LOUIS, MO.—In all cases in which there is no difficulty in retaining normal mesiodistal relations and where there is no closebite.

Question Two

In what classes or types may the guide plane be used but with more than the usual caution given to appliances? Please describe its application.

This question was asked for the purpose of finding an individual opinion on the application of the guide plane in conditions other than those in which the use of the guide plane is usually understood, or, shall we say, what might be called border line conditions.

The answers are:

BAKER.—Unable to answer.

FLESHER.—I use the bite plane or guide plane

a. In deep overbites

b. In cases of extreme supraversion of the mandibular incisors, and as bite plane to maintain the relation of the jaws.

HOPKINS.—Do not use when not fully indicated.

JACKSON.—The guide plane may be used in a great many cases of distoclusion but in *all* cases with the utmost caution regarding the reactions to it. This is particularly so regarding open-bite.

OLIVER AND IRISH.—This is amply answered in pages 293, "General Uses," 8, etc., etc.

POLLOCK.—In deep closebite cases, in which one desires vertical eruption and development of premolar region.

Question Three

In what classes or types of cases can the use of the guide plane be used with the assurance that its use is correct?

The implication in this question is that the general practice is to use the guide plane in deep overbite conditions and where there is lack of depth in the lower part of the face, with or without normal jaw relation.

BAKER.—Unable to answer.

FLESHER.—I am not sure that the bite or guide plane is correct in any case other than when it is the simplest appliance that will do the job.

HOPKINS.—Typical Class II cases with more than the normal overjet of anterior teeth.

JACKSON.—There is no appliance which can ever be used with absolute assurance that its use is correct. The only way to gauge this correctness is by careful observation to its reactions.

OLIVER AND IRISH.—This is amply answered in pages 293, "General Uses," 8, etc., etc.

POLLOCK.—Don't know.

Question Four

What mistake or mistakes are made in appliance construction which result in open-bite?

BAKER.—If the bite opens during corrective treatment, it is probable that occlusal interference has been created because proper consideration was not given to moving teeth in both arches in a manner to prevent such conditions.

FLESHER.—I regard it that it is not as much the construction of the appliance that produces an open-bite as the manner in which it is used. Open-bites are usually produced by too much stress or force in the appliance.

HOPKINS.—Lingual appliance pressing on the anterior teeth may result in open-bite where there is a tendency toward this condition, especially when used without a labial appliance.

JACKSON.—In my opinion the indiscriminate use of lingual arches with unsupported auxiliary springs is among the most prevalent errors in appliance application resulting in open-bite.

OLIVER AND IRISH.—This is amply answered in the book "Relation," 6, etc., etc., also in failure to use where indicated and failure to follow "Step Construction," 12, etc., etc.

POLLOCK.—Many times lost anchorage in the molar region, or too much lateral expansion of the molar region or too much distal tipping of the molars in an attempt to correct axial inclinations, is a result of faulty appliance application.

Question Five

What plan of appliance construction can be used to prevent "open-bite" when the bite is normal or nearly so?

BAKER.—There is some question as to what you mean by "normal bite." Answer to number four probably covers this question. I do not think that the "appliance construction" is of as much importance as proper technique and judgment in therapy.

FLESHER.—Open-bites in the treatment of normal or near normal cases are usually caused by too much stress and tipping the molars.

HOPKINS.—When one wishes to avoid open-bite, some type of labial appliance with attachment band on anterior teeth may be used; or possibly plain labial with ligatures.

JACKSON.—There are a number of labial arch appliances which when used intelligently are not conducive to producing open-bite. Among these appliances one of the most efficient from every standpoint is Johnson's twin-wire used in accordance with his specific instructions.

OLIVER AND IRISH.—The so-called "open-bite" does not and cannot result because of the proper and correct usage of the occlusal guide plane where indicated and properly constructed.

POLLOCK.—Type of appliance unimportant as long as the anchorage problem is discounted with such precision that there is no abnormal interference with the normal anchorage.

Several whose opinions were asked replied in single comments which are interesting.

DR. ALFRED PAUL ROGERS, BOSTON, MASS., referred to an original article in which he describes the results of the use of the guide plane.

DR. C. C. HOWARD, ATLANTA, GA., replied, "The law of variation asserts itself in every orthodontic problem. Specific rules and regulations must be subject to alterations in accord with the problem in hand."

DR. H. C. METZ, PITTSBURGH, PA., replied, "In my estimation there is a very definite difference between a bite plane and a guide plane. The guide plane as used by Oliver has a very definite place in Class II cases while the bite plane I use only in opening bites. Regarding open-bite conditions I feel that it is not the appliances that cause the open-bite but the adjustment of these appliances by the operator."

DR. JOHN V. MERSHON, PHILADELPHIA, PA., replied, "Since I have never used a guide plane I feel I am not qualified to express an opinion regarding it."

Objections to use of guide plane.

1. Many cases in which the guide plane is given credit for the correction of the distoclusion, if not treated, would have been corrected through normal growth and development, alone.

2. It creates habit of biting forward, thus producing a dual bite. Along toward maturity, it will usually be discovered that the distoclusion has not really been corrected.

3. Correction of distoclusion is so simple and easy the way I handle it that I have no reason to use something which has a history of so many failures.

When we remember that the only change we ever make in all our treatment is a change in the positions of the teeth by moving them in the alveolar process (never do we change the true bone of the mandible, maxillae or the temporomandibular joint) the use of the guide plane seems contraindicated. Regarding treatment of distoclusion cases there is much more to orthodontics than a choice of appliances although many men seem to feel that that is the beginning and end of orthodontics.

DR. JAMES D. MC COY, LOS ANGELES, CALIF., replied, "In my opinion, the guide plane, as an active treatment appliance, is *never indicated.* I feel that these changes necessary in the occlusal plane can better be effected through the means of controls which are available to us in our appliances. The bite plane as an

active treatment appliance is an awkward and crude method of accomplishing results, which are more readily attained by other means."

DR. JOSEPH E. JOHNSON, LOUISVILLE, KY., replied, "I have not used the bite plane for the last seven years. With my twin-wire arch technique I do not find it necessary."

DR. POLLOCK further remarks, "Unfortunately, to try and further answer these questions it seems would be confusing because frankly I do not have much confidence in the efficacy of the guide plane (in my hands at least). In the long pull posttreatment period it seems the risk of relapse is very high. However, I'm quite well aware that many good orthodontists swear by it but I prefer other methods of treatment for the most part."

SUMMARY

Questionnaires were sent to seventeen leading orthodontists of the nation. Thirteen replied. Seven of the thirteen answered the questions in detail. Six have also contributed viewpoints. Of the thirteen who replied, nine use the guide plane, three do not, and one seldom uses it.

These questions were entirely mechanical in character. However, several could not discard the scientific viewpoint.

Of the three who do not use the guide plane, two, Doctors Joseph E. Johnson and James D. McCoy, use attachments of their individual designs on anterior bands. We can recognize that these plans stabilize anchorage of individual jaws, and as the jaws are developed, improved function brings about normal or near-normal depth of the lower part of the face without the use of the guide plane. Dr. John V. Mershon, the third contributor who does not use the guide plane, does not describe his plan whereby the use of this appliance is not necessary.

On the question of mechanical cause of open-bite during treatment the majority opinion is that improper manipulation rather than incorrect appliance is responsible. The mechanical cause brings about a tipping of the molars. This tipping can be avoided by the use of the labial appliances properly stabilized, either by bands carrying attachments or by ligating to the anterior teeth.

From these opinions we would gather that properly stabilized labial appliances make the use of the guide plane unnecessary and prevent open-bite. However, the experiences of many of us have shown ready correction of posterior relation in both protrusion and retrusion without the use of the guide plane. We have also seen these conditions respond only after the guide plane was used. Then, in a few instances the use of the guide plane produced no result at all.

There are differences of opinions on the subject of bone change. One claim is that the only change is in the alveolar process, while other opinions are that changes involve other areas.

The terms "bite block," "bite plane" and "guide plane" show a difference of opinion as to the correct name for the appliance while one contributor finds objection to the metal framework, but uses one of "vulcanite or similar material."

There was an appeal by one contributor for better nomenclature.

While the scientific phase of orthodontics is most important, the mechanical

side is not insignificant. Proper education in the basic principles in the dental curriculum, thus laying a better foundation for a better understanding of orthodontic problems by the orthodontists of the future, is essential.

In conclusion I want to thank the contributors for their valuable comments. Without their cooperation this survey would not have been possible.

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The Diagnosis of Hypothyroidism in Childhood: By Lawson Wilkins, M.D., and Walter Fleischmann, M.D., *J. A. M. A.* **116**: 2459-2465, May 31, 1941.

When severe thyroid deficiency has existed over a considerable span of time during the early years of growth, it gives rise to the classic clinical pictures described as cretinism or as juvenile hypothyroidism, which are readily recognized. Many cretins, however, when seen in the first year or two of life, are less grotesquely abnormal, and on superficial inspection might be mistaken for fairly normal infants considerably younger than their actual age. In studying dwarfs of an older age, one finds almost innumerable variations and gradations from the broad, stocky build of the typical person with hypothyroidism to the slender, wiry, small-featured dwarf who presents no suggestion of thyroid deficiency.

In adults many of the familiar physical signs of hypothyroidism depend on a lowered rate of metabolism and alterations in the circulation. In addition, abnormalities in chemical processes of the body are responsible for some of the characteristic changes in subcutaneous tissues, skin, hair, and muscle to which the term myxedema has been applied. In childhood, thyroid deficiency gives rise to additional changes due to its influence on growth and development.

The most important signs which result from hypothyroidism during the period of growth have been divided into anatomic alterations in bodily structure and functional or physiologic alterations. The structural changes which are the most characteristic and the most constant are those caused by defective growth and development of the skeleton. These are stunted growth, infantile skeletal proportions, infantile naso-orbital configuration, retarded skeletal development, delayed and defective development of the teeth and epiphysial dysgenesis. The changes in other structures of the body are less characteristic and are encountered much less constantly. Frequently the hair is entirely normal and there is little, if any, change in the skin. Thickening of subcutaneous tissues and soft parts such as the lips and tongue may be suggestive of the diagnosis when found; but such changes may not be advanced, and true myxedema is rarely as extreme as in the adult.

During the juvenile period extreme degrees of hypothyroid dwarfism are encountered. On the other hand, if thyroid deficiency does not occur until later childhood—for example the tenth or twelfth year—the patient will have attained such a height before the cessation of growth that he cannot be classified as a dwarf.

As the child with hypothyroidism grows older, not only is growth retarded but the ratio of the skeletal segments remains that of a younger child, corresponding to the height age instead of the chronologic age. On the other hand, most dwarfs who do not have hypothyroidism attain their skeletal proportions approximately normal for their actual age, although this is not invariably true.

Naso-Orbital Configuration.—The characteristic faces in the child with hypothyroidism is due largely to the peculiar naso-orbital configuration. The bridge of the nose is flat and broad, causing the eyes to appear widely spaced, and the nose is short and undeveloped. The normal development of the features, and especially of the nose, is delayed, so that the child of 5 or 6 years with hypothyroidism often shows the naso-orbital conformation of an infant 1 or 2 years old.

It has been known for many years that hypothyroidism always causes delay in the appearance of ossification in the cartilaginous centers. Treatment with thyroid causes an immediate acceleration in the rate of osseous development. Endochondral ossification is at times definitely delayed in conditions which are not hypothyroid in origin. Among fifty dwarfs, in whom no evidences of thyroid deficiency were detected, 60 per cent showed delay of two to six years in appearance of the centers of ossification. In many instances the degree of retardation was as great as in patients with hypothyroidism. In these cases thyroid medication caused slight, if any, acceleration in the rate of osseous development, in contrast to the specific, rapid acceleration which occurs in patients with hypothyroidism.

The development of the teeth is always retarded, and the delay is usually proportional to that in the endochondral ossification. In addition, the teeth which erupt during the period of thyroid deficiency are defective in structure and undergo early caries.

If thyroid deficiency exists during the period in which ossification normally occurs, the appearance of the deposition of calcium is considerably delayed. When calcification finally occurs, it appears as multiple, small, irregular foci scattered over a considerable area of the cartilage. These grow larger and coalesce to form a single irregular center. According to the stage of the process, the roentgenogram may show multiple small centers of ossification or a single center which may appear either stippled, porous, fluffy, or fragmented.

If hypothyroidism exists, one should find not only anatomic changes but also definite physiologic evidences of diminished thyroid function, such as physical and mental sluggishness, circulatory changes and metabolic and chemical abnormalities. It is theoretically possible that a mild degree of hypothyroidism might exist throughout childhood without causing characteristic anatomic changes. Since thyroid deficiency might exist without any structural characteristics, the diagnosis of atypical or "borderline" forms of hypothyroidism or of mixed endocrine disturbances must depend on functional rather than structural changes.

Mental sluggishness and physical inactivity are shown, to more or less degree, by all patients with hypothyroidism. The torpor and slow mental reactions characteristic of children with hypothyroidism are distinct from retarded or de-

fective development of the brain. Thyroid therapy almost immediately causes the patient to become more alert and responsive; actual improvement in mental capacity occurs only gradually, and certain cerebral defects may be irreparable.

Reliable evidences of decreased peripheral circulation are a characteristic pale, grayish color of the cheeks and lips, and a circulatory mottling of the skin. These are usually seen in children with hypothyroidism and, indeed, they are encountered with such regularity that one should hesitate to make a diagnosis of hypothyroidism in a child with bright, ruddy cheeks and lips.

Editorial

Inter-American Orthodontic Meeting

Inasmuch as at the time this is written, it is Inter-American Week, and during this period the Rio de Janeiro Inter-American Conference is meeting in South America to decide "good neighbor" policies, the Inter-American Orthodontic Conference to be held in New Orleans in March assumes added interest and significance to orthodontists.

Technical aid is being promised to spread Latin American industrialization, with offers to train Latin American students both in U. S. engineering schools and U. S. industrial plants. Trade agreements, customs, unions, and other interesting things among South American governments also are likely to develop. It seems well timed that considerable interest in the collaboration within professions of these countries has appeared, which has for its purpose the advancement of professional interest and understanding in the Western Hemisphere.

As announced previously in this JOURNAL, the American Association of Orthodontists has invited many of the leading specialists in orthodontics in Latin American countries to be special guests at the annual meeting of the American Association of Orthodontists, to be held in New Orleans, La., March 16, 17, 18, and 19. Comprehensive plans have been made. For instance, following the regular annual meeting of the association, a three-day postgraduate course in orthodontics will be held and guests from Latin America will be afforded the opportunity to attend these complimentary sessions. It is fortunate, and to be commended, that some of the leading teachers in North America with experience in orthodontic teaching have agreed to contribute their time in furthering this gesture to help the Inter-American spirit of cooperation for the advancement of orthodontic progress.

Notwithstanding the fact that the gathering war clouds have interfered to some extent with the original plans for the conference, none the less, due to the religious perseverance of those charged with making these plans, it now becomes obvious that there will be in attendance in New Orleans many of the leading men of our Latin American neighbors. The outlined program as proposed for the conference will be found elsewhere in this issue of the JOURNAL. The hard-working program committee is composed of Earl Jones, George Anderson, and Brooks Bell. Much of the general plan of the meeting has been worked out by Dr. John Ross, Chairman of the Inter-Relations Committee, in conjunction with his committee. The reception committee is being directed under the chairmanship of Andrew F. Jackson. It is anticipated that on Monday night of the week of the meeting, a special entertainment will be provided in honor of the guests from Latin America, and no doubt this entertainment will be enjoyed by the entire membership of the American Association of Orthodontists who are in attendance at New Orleans.

It is of further interest to note that following the regular meeting of the A. A. O., there will be held a five-day postgraduate course in general dentistry

at the Army Medical Center in Washington, D. C. This will be under the personal direction of Colonel Lowell B. Wright, D. C., of the Surgeon General's Office, and will be available to all guests from Latin America and will be given as a contribution to the general purpose of the coordination of better professional relations and understanding between the Americas.

The amount of work, effort, and thought directed toward the preparations of this meeting by President Wood and his hard-working committees has been tremendous and has been made more complex, unwieldly, and uncertain by the unforseen turns taken during the dislocations of the present era. Now, at the time this is written, it can be finally said that the plans are entirely complete and on the way to a highly successful congress.

No doubt the best way for orthodontists to show their appreciation of the tremendous amount of time, effort, and work that has been put behind this meeting by President Wood and the various committees who have so ably assisted him is to be in attendance in New Orleans, March 16, 17, 18, and 19

H. C. P.

This is a message to the dentists of America, more than these—to all patriots of the United States.

The nation has pledged more than half its effort for Victory. For 1942, the President has called for 60,000 planes, 45,000 tanks, 20,000 anti-aircraft guns, and 8,000,000 tons of merchant ships. These are the sinews of war, without which our efforts will fail. This year the cost will be at least $56,000,000,000. And the dollars can come only from the pockets of the people.

We dentists will have taxes to pay. But this will not be enough. We must buy Defense Bonds steadily, systematically from now on until success crowns this mighty effort. We must provide the dollars to build tanks, ships, planes, and guns. But also, the investment of our dollars helps to curb runaway inflation. And for the future, the bonds and stamps represent individual cash reserves.

The Defense Savings Program is the people's investment program. It is designed to help Americans build both *national* and *personal* security. The money pays for the Nation's tools of war. At the same time, these dollars are subtracted from the Nation's purchasing power and help to curb inflation. In addition, the bonds and stamps represent personal reserves of cash which will be so vitally necessary if the transfer from war to peacetime causes unemployment and temporary distress.

Series E Bonds are the People's Bonds. They are on sale at all postoffices and most banks. The smallest costs $18.75, and pays $25 at maturity. Other People's Bonds cost from $37.50 ($50 maturity value) to $750 ($1,000 maturity value). Bonds are registered in the name of one or two owners, or in the name of one owner with a second person listed as beneficiary. They are nontransferable and cannot, therefore, fluctuate in value. The People's Bonds mature in ten years, but they may be redeemed any time after sixty days from the date of issue if the money is needed.

We shall buy Defense Bonds. We shall uphold the President's proclamation: "There will be no fiscal barriers to our war effort and victory."

In Memoriam

RESOLUTIONS OF THE NEW YORK SOCIETY OF ORTHODONTISTS IN MEMORY OF THE LATE ABRAHAM LINCOLN GREENFIELD AND HORACE LEONARD HOWE*

The passing of Dr. Abraham Lincoln Greenfield brings to a close the life of one of our most valuable and conscientious men in the field of dental radiography.

He was born in the City of New York on Feb. 15, 1898, and received his preparatory education at De Witt Clinton High School. In 1919 he was graduated from the New York College of Dentistry and was appointed an Instructor in Radiography. In 1925 he was elevated to head the Department of Radiography, and in 1938 was advanced to a full professorship, a position he most justly merited.

Dr. Greenfield was the author of many articles, and of several books on interpretation of dental roentgenograms. His latest book, *X-Ray Technic and Interpretation of Dental Roentgenograms,* is a standard text in many schools.

His activities were many. He was Dental Radiologist at the Montefiore Hospital, New York City; Consulting Orthodontist at the Broad Street Hospital, New York City; Visiting Lecturer to the New York University College of Medicine; Lieutenant-Commander in the Dental Corps, United States Naval Reserve; and a past-president of the Alumni Association of New York University.

In 1930 Dr. Greenfield married Miss Frances Oser of New York, who survives, with two children, a son, Kenneth Martin, and a daughter, Ann Louise.

WHEREAS, the sudden and premature death of Dr. Abraham Lincoln Greenfield on July 25, 1941, which on personal grounds has brought sorrow to his multitude of friends, is to the New York Society of Orthodontists an inestimable loss, The New York Society of Orthodontists gratefully recognizes his unselfish and skillful labors in the field of dental radiography in which science he was a nationally recognized authority.

By his death we have lost a much beloved member, whose professional and outstanding character reflected high honor upon our Society, as well as upon the dental profession, and whose memory may ever be a worthy inspiration to us, for all time.

It is fitting that we should record Dr. Greenfield's personal qualities, as they were revealed to the members of this Society and to the profession. His was a sterling character. Its genuineness was ever reflected in his gentlemanly demeanor at all times. His high-minded sense of duty to the profession and to the public should ever serve as an inspiration, and an emulation to those whose good fortune it was to know him.

The best expression of our feeling at this time is found in the words of Kipling's "Dedication," where it was said that:

> He scarce had need to doff his pride or slough the dross of earth—
> E'en as he trod that day to God so walked he from his birth
> In simpleness, and gentleness and honour and clean mirth.

Therefore, *be it resolved,* that a copy of these resolutions be spread upon our minutes, and that a copy be transmitted to Mrs. Greenfield that we may extend to her, and to the members of the family, an expression of our sympathy and heartfelt condolence.

*A resolution on the death of Dr. Howe was passed and recorded. The obituary of Dr. Howe appeared in the April, 1941, issue of the JOURNAL, Vol. 27, p. 229.

News and Notes

PRELIMINARY PROGRAM FOR THE MEETING OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS AT NEW ORLEANS, LA.

MARCH 16 TO 19, 1942

MONDAY, MARCH 16

8:30 A.M. Registration.
9:00 A.M. Golf Tournament at the Metairie Country Club.
9:00 A.M. Tours of points of interest and the French Quarter.
9:30 A.M. Board of Directors meeting.
7:00 P.M. Reception for visitors from Central and South America.

TUESDAY, MARCH 17

MORNING SESSION

9:00 A.M. Hammond organ, Mr. Ray McNamara.
9:00 A.M. Meeting called to order by President Claude R. Wood, Knoxville, Tenn. Star-Spangled Banner (one verse).
Invocation, the Most Rev. Joseph Francis Rummel, S.T.D., Archbishop of New Orleans.
Welcome, Hon. Robert S. Maestri, mayor of the City of New Orleans.
Welcome, Hon. Sam H. Jones, governor of the State of Louisiana.
Response, J. A. Burrill, Chicago, president-elect of the American Association of Orthodontists.
Introduction of Oren A. Oliver, Nashville, Tenn., president of the American Dental Association.
Introduction of Brig.-Gen. Leigh C. Fairbank, Chief of Dental Corps, United States Army.
Presentation of Visitors of Central and South American Republics, John W. Ross, Philadelphia, Pa., Chairman of Inter-Relations Committee.
Response on behalf of Central America, Samuel Fastlicht, Mexico City, presidente Associacion Mexicana De Ortodoncia.
Response on behalf of South America, Armando Monti, Buenos Aires, presidente Sociedad Argentina De Ortodoncia.
10:30 A.M. President's address, Claude R. Wood, Knoxville, Tenn.
Report of Program Committee.
11:00 A.M. The Realities of Orthodontics, Joseph D. Eby, New York City.

Synopsis: Realities in orthodontics, as in all things else, are the exact and unvarnished facts *as they exist*, regardless of whether we like them or not. The realities of today represent the sum total of every agent and every element which have influenced orthodontics since its beginning, thus contributing to its present form.

Orthodontics as a specialized branch of dentistry has just completed its fortieth year. During this period a great deal has been revealed regarding the living, vital structures of the face and body, through which the improvement of malocclusion is made possible. Scientific research and education have made their contributions to progress-improvement in diagnostic aids, advancement in treatment-planning, in metallurgy, in changing appliance designs; each has contributed a share.

The orthodontics of today is different from that of forty, thirty, twenty, or even ten years ago, but its broader philosophy and deeper scope have been definitely built upon the best structures of the past. A clear view of the composite shape of all these elements presents the form of conditions as they exist today. It also opens a vista into the future, wherein certain trends may be noted,

presaging the general progress which the science of orthodontics should reach by the time of its golden anniversary.

Through the medium of these realities we as individuals, as well as a collective group, should be able to summarize our present status and make those adjustments which become necessary to better prepare us to participate in and contribute to the new era which the next decade will bring.

AFTERNOON SESSION

Presiding, W. P. Wood, Jr., Tampa, Fla., president of Southern Society of Orthodontists.
Honorary, Armando Monti, Buenos Aires, president Argentina Society of Orthodontists.

2:00 P.M. Factors Which Control the Growth and Modification of the Maxillary Structures, Dr. Hermann Becks, University of California, San Francisco, Calif. (by invitation).

Synopsis: This first presentation includes a discussion of the morphologic changes of the maxillary structure from birth to old age, with special reference to the osseous tissue. An understanding of the genesis of the alveolar ridge and its facility for adaptive growth, as well as growth changes in the mandible, due to the effects of muscular and dental functions and (not to forget) orthodontic stimulation, must form the basis of every orthodontic procedure. (Illustrated with lantern slides.)

3:00 P.M. The Influence of the Third Molars on the Alignment of the Teeth, Dr. B. Holly Broadbent, Cleveland, Ohio, Director of the Bolton Study Department of Anatomy, Western Reserve University.

Synopsis: A discussion of clinical diagnosis and prognosis of aberrant third molar eruption. Stressing the value of routine serial records of dentofacial developmental growth progress during the second decade and urging the conservation of the "wisdom teeth" for present-day emergencies. Graphically illustrated with animated motion pictures from the Charles Bingham Bolton Fund.

3:45 P.M. The Oral Surgeon's View of the Third Molar Problem, Dr. B. Lucien Brun, Baltimore, Md. (by invitation).

Synopsis: This paper consists of the opinions and observations of an oral surgeon, presented in a comprehensive but nonspecific manner, on the problem of the unerupted and impacted third molar, indications and contraindications for its removal, and suggestions regarding its importance to the oral surgeon and to the orthodontist.

4:30 P.M. Executive Session.

Reports of the secretary-treasurer, librarian, committees, and American Board of Orthodontics; unfinished and new business.

WEDNESDAY, MARCH 18

MORNING SESSION

9:00 A.M. Presiding, Earl F. Jones, Columbus, Ohio, chairman of Program Committee of American Association of Orthodontists.

Honorary, Samuel Fastlicht, Mexico City, president of Mexican Society of Orthodontists.

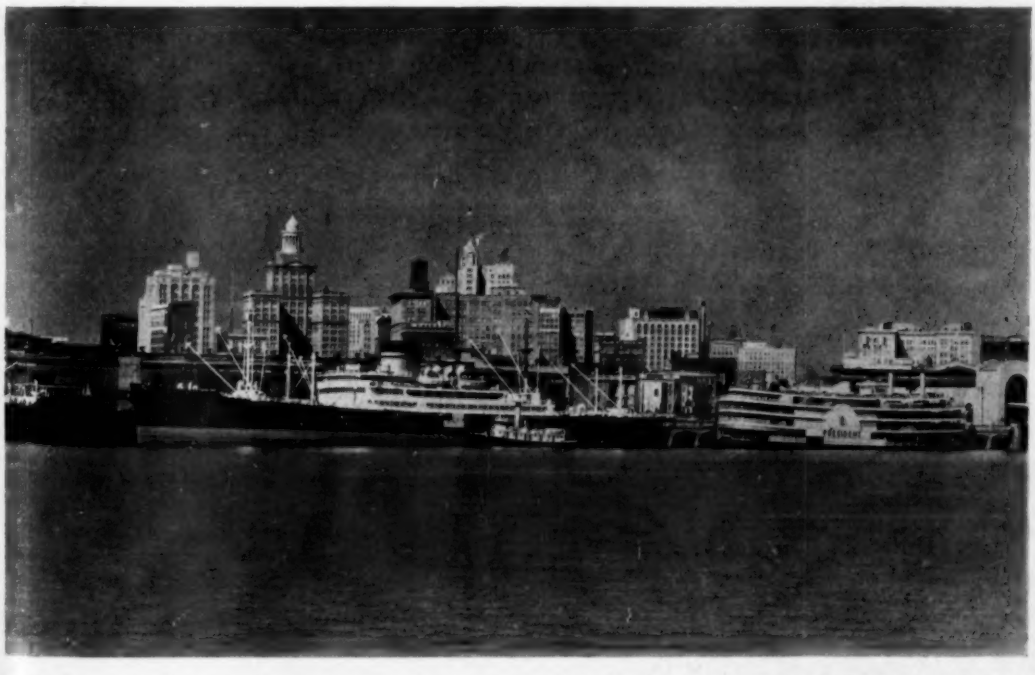
A Symposium: The diagnosis and treatment of dentofacial anomalies having the following predominating characteristics: (a) both dental arches more narrow than normal; (b) protruding upper incisors, with all of the lower teeth occupying a posterior malrelationship to the upper, with the mandibular structures markedly arrested in development; (c) bimaxillary supraversion of the incisors, with the lowers in contact with the upper gingival tissues.

This symposium is being presented by a group of clinicians, none of whom employ the same method of therapy. The problem assigned for their discussion is a serious and frequently occurring dentofacial anomaly. It has been felt that the membership will profit by hearing their differing philosophies of treatment, and in being able to judge the character of results obtained.

A. A. O. to Meet in New Orleans

New Orleans, the old and the new, where members of the American Association of Orthodontists will meet at the Roosevelt Hotel, March 16 to 19, 1942.

Jackson Square (the old Place d'Armes) which had its beginning when New Orleans was founded in 1718 by Bienville. Buildings, from left to right, Cabildo, erected in 1795, the scene of the transfer of Louisiana from Spain to France and from France to the United States in 1803; St. Louis Cathedral, built in 1794 on the site of Louisiana's first church; Presbytere, used originally by the Cathedral priests; Pontalba Apartment, one of the two rows of brick apartment style buildings, oldest in this country, erected by the Baroness Pontalba. In the foreground is Jackson Square where in 1769 the flag of Spain displaced that of France. The Jackson Monument, in the center, was designed by Clark Mills and unveiled in 1856. The Cabildo and Presbytere now house historic and natural history museums.



The skyline of modern New Orleans, city of over 500,000 people. It covers 200 square miles, is a leading industrial center, and the nation's second port in value of foreign commerce.

9:00 A.M. James D. McCoy, Los Angeles, Calif.

Synopsis: The title of this symposium comprises a general diagnostic appraisal of one of the most frequently occurring dentofacial anomalies. Successful treatment brings benefits so far reaching that it may be considered among the greatest achievements of orthodontics. In addition to limitations established by heredity, other conditioning influences prevail among which are etiologic factors, age, metabolic conditions, the application of logical treatment therapy, and skillful posttreatment care.

9:30 A.M. Russell E. Irish, Pittsburgh, Pa.

Synopsis: The successful treatment of a case of bilateral distoclusion, using the labiolingual technique.

Other dentofacial anomalies a part of the case were lack of lateral growth of the maxilla, retarded growth of the mandible, dental malfunction, anteversion of the upper incisors, lower incisors in supraversion and contacting the upper gingival tissues, mutilation due to loss of one molar, arrested development.

Short paper, descriptive slides, discussion as the allotted time permits.

10:00 A.M. Samuel J. Lewis, Detroit, Mich.

Synopsis: A prerequisite for the successful treatment of malocclusion of the teeth is to position the mandibular incisors upright on basal bone. Thus positioned, they are in functional mechanical balance and constitute the most accurate treatment guide available for an orthodontist.

The Edgewise Arch Mechanism is well adapted for this type of treatment, and will, if used properly, result in better facial harmony and balance, more permanence of tooth position, and normal function of the supporting and surrounding structures.

10:30 A.M. Spencer R. Atkinson, Pasadena, Calif.

Synopsis: Philosophy of Treatment.

The material presented will cover (1) changing anatomic landmarks of the head of a growing child; (2) anatomic landmarks of the head of an adult of practical use to the orthodontist; (3) development of the teeth; (4) obtaining optimum anchorage; (5) strategy of treatment; (6) some common causes of malocclusion; (7) retention.

11:00 A.M. Dr. Joseph E. Johnson, Louisville, Ky.

Synopsis: Reasons for my plan of treatment, appliances used to carry out this plan, oral photographs taken at regular intervals showing the different steps in the treatment, and the progress made.

12:00 P.M. Past Presidents' Luncheon, Pan American Room. Limited to past presidents of the American Association of Orthodontists.

AFTERNOON SESSION

2:00 P.M. Presiding, George M. Anderson, Baltimore, Md., member of Program Committee of American Association of Orthodontists.

Honorary, Arturo Rojas, Lima, Peru.

Orthodontics as Practiced in South America, Dr. Armando E. Monti, Buenos Aires, Argentina (by invitation).

Synopsis: We do not have the official title of Dr. Monti's paper or his synopsis, but we are sure he will give us a paper worthy of attention. Dr. Monti is the author of an elaborate text on orthodontics, and is professor of orthodontics at the University at Buenos Aires.

3:00 P.M. Case Report: An Orthodontic and Prosthetic Restoration in the Mouth of the Largest Man in the World, Dr. Robert I. Frank, Los Angeles, Calif. (by invitation).

Synopsis: A case report showing the correlation of orthodontic and prosthetic restorations in correction of dental and facial anomalies. Colored slides will be used to demonstrate the corrective procedures.

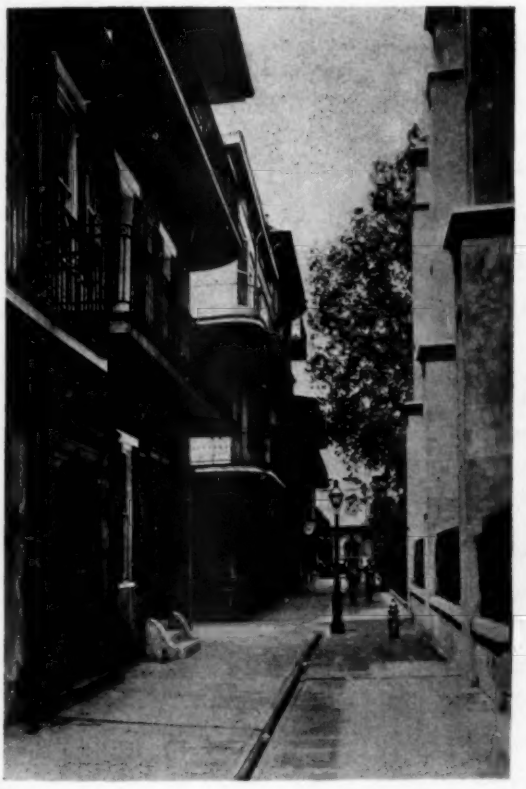
3:15 P.M. Various Pathologic Processes Interfering With Adaptive Tissue Changes in Orthodontics, Dr. Hermann Becks, University of California, San Francisco, Calif. (by invitation).

Synopsis: Endocrine dysfunctions, dietary deficiencies, as well as hyper- and hypo-vitaminosis, and a number of other systemic disorders, may influence, to a large extent, the structural design of the jaws and face. Recent experimental investigations point out the great importance of a better knowledge of these pathologic processes for the orthodontic practitioner, to enable him to recognize the early manifestations of systemic origin. (Illustrated with lantern slides.)

4:15 P.M. Executive session.
Nomination of officers.
Election of committeemen.

6:30 P.M. President's reception.

7:30 P.M. Banquet, entertainment, and dance.



Left, Pirates' Alley, in the heart of New Orleans' French Quarter runs along one side of St. Louis Cathedral and is bounded on the other by the Cabildo. The Alley received its name from the countless tales about the famous pirate, Jean Lafitte, who is said to have used it in the transportation of smuggled goods about the city.

Right, A typical example of the lace iron balconies that are found so profusely in the French Quarter is the home located at the intersection of St. Peter Street and the Rue Royale, just a block from Jackson Square. The elaborate lace iron balcony dates back to the days of the Creoles when it was the vogue to outdo one's neighbors in elaborate detail of patterns.

THURSDAY, MARCH 19

MORNING SESSION

9:30 A.M. Presiding, Brooks Bell, Dallas, Texas, member of Program Committee of American Association of Orthodontists.
Honorary, Alfredo A. Morales, Guatemala, C. A.
Reviewing the Problem of Retention, Dr. Ralph Waldron, Newark, N. J.

Synopsis:

1. The necessity for skull and denture relationship.
2. The necessity for normal approximal contact of the teeth.
3. What part do the transeptal fibers play in the retention of the teeth?
4. Bone regeneration during the retention period.
5. Are roentgen rays of any help in determining bone density in establishing time necessary for retention?
6. Some causes for relapse.
7. Why do the lower anterior teeth so often relapse into irregularities?
8. The influence of erupting and impacted third molars on the occlusion of treated cases.
9. Do fixed or removable retainers offer better opportunity for bone regeneration?
10. Is myofunctional therapy an adjunct to mechanical retention?
11. Types of retention appliances and their application to the maintenance of occlusion.

10:45 A.M. Root Resorption, Samuel Fastlicht, Mexico City, Mexico.

11:30 A.M. Presentation of the Albert H. Ketcham Memorial Award.

This memorial award consists of an illuminated parchment, appropriately inscribed, and is awarded annually to an orthodontist or some other person, who, in the judgment of the award committee, has made a notable contribution to the science and art of orthodontics during the current year or some previous period.

AFTERNOON SESSION

GROUP CLINICS, 1:30 TO 4:30

1. Open-Tube Appliance Construction under the direction of Dr. James D. McCoy, Los Angeles, Calif.

Summary: Fabrication of the open-tube appliance for the control of the maxillary teeth to be used in conjunction with the removable lingual arch wire upon the mandibular teeth in the treatment of cases discussed in the symposium.

1. Requirements of treatment established by the diagnosis.
2. The establishment of the maxillary appliance in a passive state.
3. The initiation of tooth movement.
4. Auxiliaries to the labial arch wire.
5. (a) Individual tooth movements.
   (b) En masse tooth movements.
   (c) Mandibular changes.

2. Labiolingual Appliance Construction under the direction of Dr. Oren A. Oliver, Nashville, Tenn.

Summary:

1. Complete description of the labiolingual arch technique illustrated step by step, mounted on display boards with captions.
2. Enlarged photographs displaying various types of auxiliary springs.
3. Treated cases with appliances, showing results obtained.
4. Models before and after treatment.

Band Technique, Dr. Philip E. Adams, Boston, Mass.

Construction of Labial and Lingual Appliances Using Chrome Nickel With Precious Metal for Auxiliary Springs, Dr. Boyd Tarpley, Birmingham, Ala.

Construction of Labial and Lingual Appliances and Soldering of Auxiliary Springs Using Precious Metals, Dr. A. G. Miller, Washington, D. C.

Guide Plane Technique Using Chrome Nickel, Dr. William A. Giblin, Montclair, N. J.

Guide Plane Technique Using Precious Metals, Dr. Oren A. Oliver, Nashville, Tenn.

An Explanation of Various Types of Auxiliary Springs Used in the Labiolingual Technique, Dr. Walter McFall, Asheville, N. C.

3. Edgewise Arch Appliance Construction under the direction of Dr. Samuel J. Lewis, Detroit, Mich.

Summary: The complete fabrication of the edgewise arch mechanism as used by Dr. Charles H. Tweed and his co-workers in the treatment of Class II, Division I, malocclusion. Typodont set-ups from an actual case report will be used showing preliminary arch application, anchorage preparation, coordinated second order bends and torque force, distal en masse movement of the maxillary teeth and detailed positioning of the teeth prior to retention. In addition, we will present twenty-five case reports with before and after models, photographs, and x-rays.

Preliminary Round Arch Set-Up and Use of Vertical Loops in Maxillary Arch, Dr. Allen Collins, Detroit, Mich.

Preparation of Anchorage, Dr. Robert E. Coleman, Detroit, Mich.

Distal En Masse Movement of Maxillary Teeth, Dr. Louis Braun, Detroit, Mich.

Detailed Tooth Positioning Prior to Retention and to Include Retention, Dr. F. Copeland Sheldon, Kansas City, Mo.

Fashioning Working and Ideal Arch Wires, Dr. Samuel J. Lewis, Detroit, Mich.

4. Universal Arch Appliance Construction under the direction of Dr. Spencer R. Atkinson, Pasadena, Calif., assisted by: C. F. Stenson Dillon, Edwin Erikson, Ralph Waldron, Francis W. Nash, William H. Pearson, Carl P. Cline, Donald C. MacEwan, Samuel Fastlicht. and Ray McClinton.

Summary:

1. Selection of appliance for individual case.
2. Appliance for complete dentition.
3. Appliance for mixed dentition.
4. Molar band technique.
5. Models before and after treatment.
6. Lingual arch technique.
7. Labial arch technique.
8. Sectional arch technique.
9. Occipital anchorage.
10. Anatomic exhibit.
11. Retention.

5. Twin-Arch Appliance Construction under the direction of Dr. Lowrie J. Porter, New York City.

Johnson Technique of Anterior and Molar Band Making Demonstrated on Manikin, Dr. Henry U. Barber, New York City.

Accurate Positioning of Johnson Twin-Wire Arch in Relation to the Anterior Teeth and Method of Locating Position of Molar Buccal Tubes, Dr. Joseph D. Eby, New York City.

(A) Vise for Pulling of Twin Arches With Guide for Placing of Intermaxillary Hooks; (B) Device for Spinning Coil Springs, Dr. Lowrie J. Porter, New York City.

Various Types and Sizes of Johnson Twin-Wire Arches With and Without Coil Spring Assembly, Dr. Clare K. Madden, Greenwich, Conn.

(A) Manikin Demonstration of Seating and Unseating Twin Arch Locks; (B) Adjustments of Twin Arches With and Without Coil Springs, Dr. Joseph E. Johnson, Louisville, Ky.

6. Fabricating Chrome Alloy into the Different Types of Treatment Appliances under the direction of Dr. George H. Herbert, St. Louis, Mo.

Summary: The purpose of this clinic is to give the orthodontist who is interested in using chrome alloy in his practice a chance to see his favorite appliance constructed with it. It is our goal to show the different steps in constructing the most popular appliances, also to show the finished appliances. Men have been selected who are recognized in using the particular appliance they will demonstrate and who have mastered the technique of building their appliances with chrome alloy.

To simplify the presentation and try to give each one that is interested a better chance to observe what he wants, we have selected two men to demonstrate each appliance. One will show construction and the other the finished product and its possibilities.

The men who will assist with the clinic are:

Dr. Mark Perrin, Topeka, Kan.
Dr. Leo M. Shanley, St. Louis, Mo.
Dr. William Humphrey, Denver, Colo.
Dr. Cecil G. Muller, Omaha, Neb.
Dr. George L. Turner, Los Angeles, Calif.
Dr. Alfred Higson, Beverly Hills, Calif.

4:30 P.M. Executive Session.
Report of Committee on President's Address.
Report of Budget Committee.
Installation of Officers.
Conferring Past President's Key.
Adjourment.

American Association of Orthodontists

The 1942 meeting of the American Association of Orthodontists will be held at the Roosevelt Hotel, New Orleans, La., March 16 to 19, 1942. This will be a Pan-American Congress. A very special invitation is extended to orthodontists in Central and South America.

Five-State Postgraduate Clinic

The annual Five-State Postgraduate Clinic of the District of Columbia Dental Society will convene at the Mayflower Hotel, Washington, D. C., March 8 to 12, 1942.

Southern Society of Orthodontists

The next annual meeting of the Southern Society of Orthodontists will be held in conjunction with that of the American Association of Orthodontists in New Orleans on March 16 to 19, inclusive. There will be no scientific program arranged separately so that members can attend the meetings of the American. There will, however, be a short business meeting sometime during the sessions, details of which will be announced later.

E. C. LUNSFORD, Secretary.

Southwestern Society of Orthodontists

The February, 1942, meeting of the Southwestern Society of Orthodontists has been postponed; however a regular business session will be held during the meeting of the American Association of Orthodontists in New Orleans, March 16 to 19, 1942.

R. E. OLSON, Secretary.

Cleveland Dental Society

The annual spring Clinic Meeting of the Cleveland Dental Society will be held May 4 to 6, 1942, at the Statler Hotel, Cleveland, Ohio.

Rocky Mountain Society of Orthodontists

The Rocky Mountain Society of Orthodontists meets monthly from October to May. The meetings are called for 10 A.M.; they last through the forenoon and are followed by a luncheon and business meeting.

At the October meeting Dr. George F. Bowden presented a paper and clinic on the construction and manipulation of the universal appliance as taught by Dr. Spencer R. Atkinson and showed a series of treated cases. At the November meeting each member was asked to present a case report from his own practice. Most of the cases presented represented those which had been failures under one type of treatment but had responded favorably under a different treatment. The discussion which followed was interesting and instructive. At the December meeting Dr. Harold E. Rice of Colorado Springs gave a clinic on the use and construction of the twin-arch technique as taught by Dr. Joseph E. Johnson.

Mexican Orthodontic Society

The Mexican Orthodontic Society has elected the following officers for the coming year:

President, Dr. Samuel Fastlicht
Secretary, Dr. Guillermo S. Gamboa
Treasurer, Dr. Emilio Berea Fabela

Ontario Dental Association

The Seventy-Fifth Annual Convention of the Ontario Dental Association will be held at the Royal York Hotel, Toronto, Ont., May 18 to 21, 1942. Dentists from the United States and all parts of Canada are welcome.

American Board of Orthodontics

The 1942 meeting of the American Board of Orthodontics will be held at the Roosevelt Hotel, New Orleans, La., March 14, 15, and 16. Orthodontists who may desire to be certified by the Board may obtain application blanks from the Secretary, Dr. Bernard G. deVries, 705 Medical Arts Bldg., Minneapolis, Minn.

Edward H. Angle Society of Orthodontia

The thirteenth biennial meeting of the Edward H. Angle Society of Orthodontia will be held at Hotel Del Monte, Calif., March 25 to 31, 1942.

OFFICERS OF ORTHODONTIC SOCIETIES*

American Association of Orthodontists

President, Claude R. Wood _ _ _ _ _ _ _ _ 608 Medical Arts Bldg., Knoxville, Tenn.
Secretary-Treasurer, Max E. Ernst _ _ _ 1250 Lowry Medical Arts Bldg., St. Paul, Minn.
Public Relations Bureau Director, Dwight Anderson
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ 292 Madison Ave., New York, N. Y.

Central Association of Orthodontists

President, Harold J. Noyes _ _ _ _ _ _ _ _ 55 E. Washington St., Chicago, Ill.
Secretary-Treasurer, L. B. Higley _ _ _ _ _ _ _ 705 Summit Ave., Iowa City, Iowa

Great Lakes Society of Orthodontists

President, Henry D. Cossitt _ _ _ _ _ _ _ _ _ 942 Nicholas Bldg., Toledo, Ohio
Secretary-Treasurer, C. Edward Martinek _ _ _ _ _ _ 660 Fisher Bldg., Detroit, Mich.

New York Society of Orthodontists

President, Sidney E. Riesner _ _ _ _ _ _ _ _ 136 E. 36th St., New York, N. Y.
Secretary-Treasurer, William C. Keller _ _ _ _ 40 E. Forty-Ninth St., New York, N. Y.

Pacific Coast Society of Orthodontists

President, Ben L. Reese _ _ _ _ _ _ _ _ _ _ Roosevelt Bldg., Los Angeles, Calif.
Secretary-Treasurer, Earl F. Lussier _ _ _ _ _ 450 Sutter St., San Francisco, Calif.

Rocky Mountain Society of Orthodontists

President, George H. Siersma _ _ _ _ _ _ _ _ 1232 Republic Bldg., Denver, Colo.
Secretary-Treasurer, Curtis L. Benight _ _ _ _ _ 1001 Republic Bldg., Denver, Colo.

Southern Society of Orthodontists

President, W. P. Wood, Jr. _ _ _ _ _ _ _ _ _ 442 W. Lafayette St., Tampa, Fla.
Secretary-Treasurer, E. C. Lunsford _ _ _ _ _ 2742 Biscayne Blvd., Miami, Fla.

Southwestern Society of Orthodontists

President, E. Forris Woodring _ _ _ _ _ _ _ _ Medical Arts Bldg., Tulsa, Okla.
Secretary-Treasurer, R. E. Olson _ _ _ _ _ _ Union Nat'l Bank Bldg., Wichita, Kan.

American Board of Orthodontics

President, Charles R. Baker _ _ _ _ _ _ _ _ _ _ 636 Church St., Evanston, Ill.
Vice-President, Frederic T. Murlless, Jr. _ _ _ _ 43 Farmington Ave., Hartford, Conn.
Secretary, Bernard G. DeVries _ _ _ _ _ _ _ Medical Arts Bldg., Minneapolis, Minn.
Treasurer, Oliver W. White _ _ _ _ _ _ _ 213 David Whitney Bldg., Detroit, Mich.
William E. Flesher _ _ _ _ 806 Medical Arts Bldg., Oklahoma City, Okla.
James D. McCoy _ _ _ _ _ _ _ 3839 Wilshire Blvd., Los Angeles, Calif.
Joseph D. Eby _ _ _ _ _ _ _ _ _ 121 E. 60th St., New York, N. Y.

Harvard Society of Orthodontists

President, Harold J. Nice _ _ _ _ _ _ _ _ 475 Commonwealth Ave., Boston, Mass.
Secretary-Treasurer, Edward I. Silver _ _ _ _ _ _ _ 80 Boylston St., Boston, Mass.

Washington-Baltimore Society of Orthodontists

President, Paul W. Hoffman _ _ _ _ _ _ _ 1835 Eye St., N. W., Washington, D. C.
Secretary-Treasurer, Stephen C. Hopkins _ _ _ _ _ 1726 Eye St., Washington, D. C.

Foreign Societies†

British Society for the Study of Orthodontics

President, S. A. Riddett
Secretary, R. Cutler
Treasurer, Harold Chapman

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*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.

†The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis, Mo., U. S. A.

1911 Class of the Angle School of Orthodontia, St. Louis, Mo. *1*, Frye. *2*, H. F. Sturdevant. *3*, Boltz. *4*, F. W. McDonald. *5*, Samuel Lewis. *6*, H. C. Pollock. *7*, H. F. Stillwell. *8*, Julius Minez. *9*, John McCoy. *10*, E. S. Butler. *11*, C. O. Engstrom. *12*, Robert Vaughan. *13*, Hugh K. Hatfield. *14*, W. H. Pearson. *15*, Lawrence Baker. *16*, B. Lane. *17*, Josef Grunberg. *18*, Milo Hellman. *19*, Albin Oppenheim. *20*, Albert Crosby. *21*, Genette Harbour. *22*, W. S. Watson. *23*, C. C. Howard. *24*, C. A. Sayers. *25*, Mrs. Edward Angle. *26*, Smith. *27*, Edward H. Angle. *28*, Guilhermena P. Mendel. *29*, McArthur. (Courtesy of Dr. B. W. Weinberger, New York, N. Y.)